

CONDENSED  
CATALOG

*Controls*

*by:*

BARBER-COLMAN  
• COMPANY •

ROCKFORD - ILLINOIS

U. S. A.







***Electric***  
**CONTROLS**  
*for*  
**HEATING**  
**VENTILATING**  
**AIR CONDITIONING**  
**INDUSTRIAL APPLICATIONS**



BARBER-COLMAN COMPANY

ILLINOIS Moline Office IOWA

HARVEY C. REIMERS

— TELEPHONE 3367 —

2425 - 12TH ST. - MOLINE, ILL.

BARBER-COLMAN COMPANY - ROCKFORD, ILLINOIS, U. S. A.

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## FORWARD

ALL control problems depend for their proper solution upon one of three general types of control systems—(1) TWO POSITION (or “on and off”) CONTROL, (2) FLOATING CONTROL, and (3) PROPORTIONING CONTROL. No simple and general rules can be stated which make it possible to identify a given control problem with its proper control system. The proper control system for each case can be determined only after a careful study of all the conditions involved. Except when past experience dictates the type of control system necessary, we recommend that you call the Barber-Colman control engineer in your locality.

BARBER-COLMAN COMPANY  
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2425 - 12TH ST. Moline, ILL.

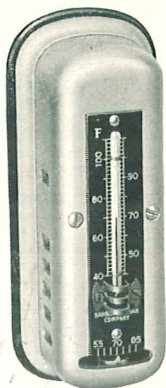
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BARBER-COLMAN CONTROL EQUIPMENT  
IS LISTED AS STANDARD BY THE  
UNDERWRITERS' LABORATORIES

# THERMOSTATS

## ROOM TYPE FOR TWO POSITION CONTROL



**Low Voltage, Snap-Action:** Are available for either two or three-wire circuits. A bimetal temperature-sensitive element warps the tongue against one or the other of two fixed contacts. "Detents" (small permanent magnets) provide snap-action.

**Construction:** Single unit, consisting of bimetal element, tongue, contact, adjusting means, and detents. Bakelite case and ventilated cover. Three-coded binding post under base. All instruments have adjustable U-shaped straps which can be set for high or low limit or to lock adjusting lever.

**Differential:** 2°.

**Electrical Rating:** 2.5 amperes at 25 volts, AC.

**Dimensions:** 2 $\frac{1}{8}$ " wide, 5 $\frac{3}{8}$ " high, 1 $\frac{3}{4}$ " deep.

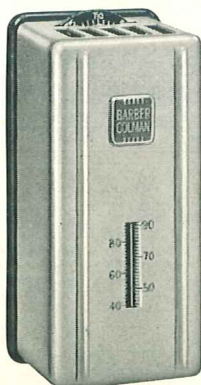
TYPE	RANGE	USE
YDA 291-2	55°- 85°	2 or 3-Wire Control
YDA 297-2	40°- 70°	2 or 3-Wire Control
YDA 315-2	70°-100°	2 or 3-Wire Control
YDA 317-2	55°- 85°	3-Wire Heat Anticipating
YDA 302-2	55°- 85°	Compensated Control

**Special Features:** The following special features are available on order:

1. Internal adjustment
2. Positive closing switch
3. Centigrade scale
4. Without thermometer

**When Ordering Specify:** Type, and special features required.

## ROOM THERMOSTATS FOR TWO POSITION CONTROL



**High Voltage, Snap-Action:** Designed for line voltage service to handle directly equipment within its rating. For heavy duty unit heater installations and control of industrial space heating equipment. Powerful Alnico magnet provides snap-action. S.P.S.T. Switch action. Circuit closes on temperature drop.

**Construction:** Metal case with recessed thermometer covers the mechanism which is mounted on a black bakelite base. Cover finished in dull antique silver with blue name-plate. Black bakelite adjusting dial with white numerals and divisions can be locked in position by means of locking screw. Each instrument is furnished with a mounting plate to fit standard outlet boxes.

**Dimensions:** 2 $\frac{3}{8}$ " wide, 4 $\frac{5}{8}$ " high, 2" deep.

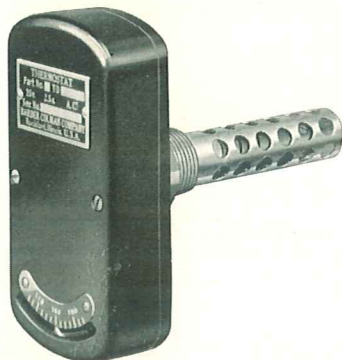
**Differential:** 3°.

TYPE	RANGE	RATING
DYDA 454	40°-80°	1 H.P., AC. 250 V. Max.



## THERMOSTATS

### DUCT TYPE FOR TWO POSITION CONTROL



**Uses:** For the control of air temperatures in ducts, chambers, or other closed passages. Thermostat is inserted through wall of duct or chamber.

**Construction:** Single unit, consisting of helical bimetal element, tongue, contacts, and adjusting means. "Detents" (small permanent magnets) provide snap-action movement of tongue. Non-detent instruments for floating control also available. External adjustment. Element with perforated guard projects into chamber. Mechanism is in heat-resistant bakelite case on outside. Spring yield device on tongue prevents strain from extreme temperature variations. Vapor service instrument has all exposed parts, except bimetal element made of bronze. A baffle plate prevents escape of vapor into case. Mounted by screwing into the threaded hole ( $\frac{3}{4}$ " pipe thread) or flange.

**Differential:** 2°.

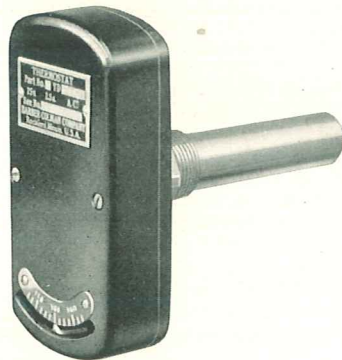
**Rating:** 2.5 amperes at 25 volt, AC.

**Dimensions:** Case: 2 $\frac{5}{8}$ " wide, 5" high, 1 $\frac{1}{4}$ " deep,  $\frac{1}{2}$ " clearance at back. Element with guard:  $\frac{7}{8}$ " diameter; length, as indicated.

TYPE	RANGE	CALIBRATED AT	INSERTED LENGTH	SERVICE
FYDJ 101	40°-160°	100°	3 $\frac{1}{4}$ "	Air
FYDJ 103	Locked	35°	3 $\frac{1}{4}$ "	Fresh Air Duct
FYDJ 105	50°-90°	70°	3 $\frac{1}{4}$ "	Air
FYDJ 164	35°-75°	55°	3"	Vapor

**When Ordering Specify:** Type, and details of application.

### IMMERSION TYPE FOR TWO POSITION CONTROL



**Uses:** For pipes, tanks, etc., containing liquids. The sensitive element of the Thermostat is contained in a tube which is to be immersed in the liquid.

**Construction:** Similar to Duct Thermostat except the element guard is a closed tube. To insure maximum rate of response types FYDJ 156 and 168 have tube partially filled with mercury and suitably sealed. Spring yield device prevents strain on tongue from extreme temperature variations. Non-detent instruments for floating control also available.

**Differential:** 2°.

**Rating:** 2.5 amperes at 25 volts, AC.

**Dimensions:** Case: 2 $\frac{5}{8}$ " wide, 5" high, 1 $\frac{1}{4}$ " deep,  $\frac{1}{2}$ " clearance at back. Element, with guard:  $\frac{7}{8}$ " diameter; length, as indicated.

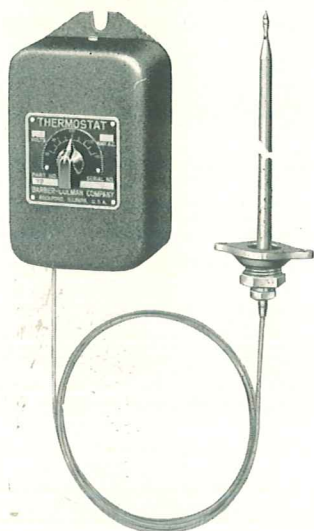
**Installation:** Type FYDJ 111 may be installed in any position; Types FYDJ 156 and 168 with tubes horizontal.

TYPE	RANGE	CALIBRATED AT	INSERTED LENGTH
FYDJ 111	90°-210°	150°	3"
FYDJ 156	90°-210°	150°	5"
FYDJ 168	35°-75°	55°	5"

**When Ordering Specify:** Type, and details of application.

# THERMOSTATS

## REMOTE BULB TYPE FOR TWO POSITION CONTROL



**Uses:** For control of temperature in ducts, plenum chambers, dryers, liquid lines, tanks, evaporators, and vats.

**Construction:** Unit consists of bulb and bellows assembly, metal contact tongue, single-pole, double-throw contact, and adjusting means. "Detents" (small permanent magnets) provide snap-action movement of tongue. Bulb and bellows are of seamless construction and hydraulically formed. Internal plunger within the bellows reduces the volume of the bellows without sacrificing effective force. Effect of ambient temperatures is reduced to a minimum. All parts, except remote bulb and capillary tube, are mounted in a case with steel base and bakelite sub-base. Adjusting knob extends through cover. Non-detent instruments for floating control also available.

**Dimensions:** Case  $4\frac{3}{16}$ " wide,  $7\frac{5}{8}$ " high,  $2\frac{5}{8}$ " deep.  
Capillary tube standard length 6 feet.

**Differential:** 2°.

**Electrical Rating:** 2.5 amperes at 25 volts, AC.

TYPE	RANGE
BYDK 752	35°- 75°
BYDK 756	50°- 90°
BYDK 775	40°-160°

## INDUSTRIAL TYPE

**Construction:** Similar to the above except heavy duty, totally enclosed S.P.D.T. switch. Armored capillary tube. Standard tube length 6 feet.

**Electrical Rating:** 10 amperes at 115 volts, AC.

**Differential:** 3°.

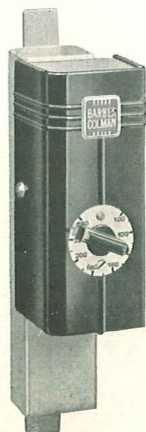
TYPE	RANGE
BYDK 789	40°-160°
BYDK 781	90°-210°
BYDK 782	180°-300°
BYDK 783	270°-390°
BYDK 784	360°-480°

**Special Features:** The following special features are available on order:

1. Special length of capillary tube of 10' or 15'.
2. Stainless steel bulb.
3. Standard types for floating control.
4. Finned type bulb.

**When Ordering Specify:** Type, and special features.

## SURFACE TYPE FOR TWO POSITION CONTROL



**High Voltage — Snap-Action:** Remote control for use with unit heaters to prevent operation of fan until coils are heated. Strap-on type, with single-pole, single-throw switch that closes on rising temperature. May be mounted in either horizontal or vertical position and on pipes up to 6" in diameter. External adjustment dial and knob.

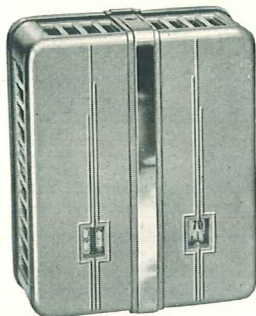
TYPE	SCALE
CYDP 195	100°-240°

**Electrical Rating:**  $\frac{3}{4}$  h.p., 110-220 volts, AC., 1 ph.



# THERMOSTATS

## ROOM MICROTHERM FOR PROPORTIONING CONTROL



**Uses:** For accurate proportioning control of valves, dampers, and program switches in the maintenance of room temperature.

**Construction:** Consists of flat bimetal element, contacts, adjusting means, thermometer, and solenoid all mounted in a well ventilated bakelite case. Thermal element is mounted in a horizontal plane so as to expose the greatest possible surface to air currents.

**Dimensions:**  $3\frac{13}{16}$ " wide,  $4\frac{9}{16}$ " high,  $1\frac{13}{16}$ " deep.

**Voltage:** For 25 volts, 60 cycles AC. only.

TYPE  
BYDT 121-1

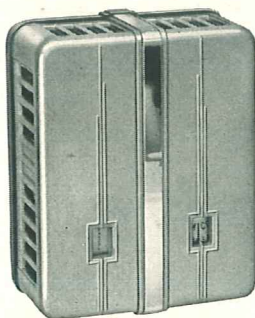
RANGE  
50°-90°

**Special Features:** The following special features are available on order:

1. Two-temperature type—includes a small resistance heater inside case. When heater is energized for night operation, Microtherm controls at approximately 10° below its setting.
2. Centigrade scale.
3. Key adjustment.

**When Ordering Specify:** Type, and special features required.

## MICRO COMFORTSTAT FOR PROPORTIONING CONTROL



**Uses:** For proportioning control of room effective temperatures in Micro-Control circuits. The Micro-Comfortstat is particularly adapted to proportioning control of temperature in spaces in which there is no control of humidity.

**Construction:** Consists of flat bimetal temperature-sensitive element, hygroscopic hair element, and contacts, with addition of solenoid and adjusting means, all mounted in a well ventilated bakelite case. Cool-Warm setting dial visible through viewing window: "S" indicates average summer setting, "W" indicates average winter setting. Thermometer and graduations on setting dial omitted to avoid confusion between effective and dry-bulb temperature. Key adjustment also available.

	DRY-BULB	RELATIVE HUMIDITY	EFFECTIVE TEMPERATURE
<b>Calibration:</b>	73°	50%	69°

**Voltage:** For 25 V., 60 cycle AC., only.

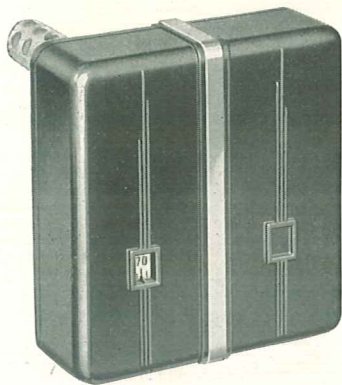
**Dimensions:**  $3\frac{13}{16}$ " wide,  $4\frac{9}{16}$ " high,  $1\frac{13}{16}$ " deep.

TYPE  
CYDG 221-1

ADJUSTMENT  
External

## THERMOSTATS

### DUCT MICROTHERM FOR PROPORTIONING CONTROL



**Uses:** For proportioning control of air temperatures in ducts, chambers, or other closed passages. Microtherm is inserted through wall of duct or chamber.

**Construction:** Similar to Room type, except element is extended and protected by a perforated guard. No thermometer.

**Installation:** To be mounted with tube horizontal.

**Dimensions:** Case —  $4\frac{13}{16}$ " wide,  $5\frac{1}{8}$ " high,  $1\frac{5}{8}$ " deep,  $1\frac{1}{8}$ " clearance at back. Element, with guard:  $\frac{7}{8}$ " diameter; length, as indicated.

**Voltage:** For 25 volts, 60 cycles AC., only.

TYPE	RANGE	INSERTED LENGTH	USES
CYDT 125	50°– 90°	3"	Return Air
CYDT 127-1	40°–160°	3"	Fan Discharge

**Special Features:** The following special features are available on order:

1. Internal adjustment.
2. Centigrade scale.
3. Extra length of element guards up to 24".

**When Ordering Specify:** Type, and special features required.

### IMMERSION MICROTHERM FOR PROPORTIONING CONTROL



**Uses:** For proportioning control of liquid temperatures in pipes, tanks, etc.

**Construction:** Similar to Duct type, except that the element guard is a closed tube, partially filled with mercury and suitably sealed.

**Installation:** To be mounted with tube horizontal.

**Dimensions:** Case —  $4\frac{13}{16}$ " wide,  $5\frac{1}{8}$ " high,  $1\frac{5}{8}$ " deep,  $1\frac{1}{8}$ " clearance at back. Element, with guard:  $\frac{7}{8}$ " diameter; length, as indicated.

**Voltage:** For 25 volts, 60 cycles AC., only.

TYPE	RANGE	INSERTED LENGTH
CYDT 128	35°– 75°	5"
CYDT 130	90°–210°	5"

**Special Features:** The following special features are available on order:

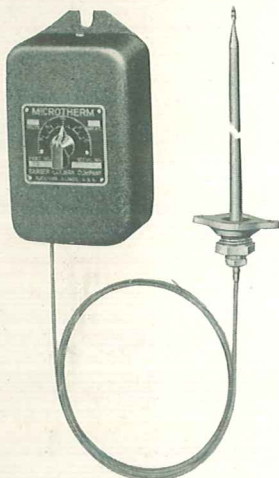
1. Internal adjustment.
2. Centigrade scale.
3. Extra length of element guards up to 24".

**When Ordering Specify:** Type, and special features required.



## THERMOSTATS

### REMOTE BULB MICROTHERM FOR PROPORTIONING CONTROL



**Uses:** For proportioning control on applications in which the temperature-sensitive element must be mounted in inaccessible air ducts, liquid lines, tanks, etc.

**Construction:** Consists of bulb and bellows assembly, solenoid and spring, metal contact tongue, single-pole, double-throw contacts, and adjusting means. Bulb and bellows are of seamless construction and hydraulically formed. Internal plunger within the bellows reduces the volume of the bellows without sacrificing effective force. Effect of ambient temperature reduced to a minimum. All parts, except the remote bulb and capillary tube, are mounted in a case with steel base and bakelite sub-base. Adjusting knob extends through cover.

Capillary tube standard length 6 feet long.

**Installation:** Case must be mounted on a vertical surface. Remote bulb may be installed in any position.

**Dimensions:** Case  $4\frac{3}{16}$ " wide,  $7\frac{5}{8}$ " high,  $2\frac{5}{8}$ " deep.

**Voltage:** For 25 volts, 60 cycles AC., only.

TYPE	RANGE	DROOP
CYDK 461	35°- 75°	Low
CYDK 462	35°- 75°	High
CYDK 463	50°- 90°	Low
CYDK 469	40°-160°	High

### INDUSTRIAL TYPE

**Construction:** Similar to above except capillary tube armored type. Standard length 6 feet. All instruments have approximately 15° droop.

TYPE	RANGE
CYDK 479	40°-160°
CYDK 475	90°-210°
CYDK 476	180°-300°
CYDK 477	270°-390°
CYDK 478	360°-480°

**Special Features:** The following special features are available on order:

1. Special length of capillary tube of 10 or 15 feet.
2. Stainless steel bulb.
3. Finned Type bulb.

**When Ordering Specify:** Type, and special features desired.

### PRESSURE SWITCH FOR PROPORTIONING CONTROL



**Uses:** For proportioning control of the capacity of heating or cooling equipment, suction pressures of multiple compressor installations, gas burners, steam pressure control of proportioning type oil burners, stokers, etc.

**Specifications:** Available in ranges from 0—200 pounds.

**Pressure Fitting:**  $\frac{1}{4}$ " Connections.

**Electrical Rating:** Low voltage AC., only.

**Dimensions:** Case  $4\frac{5}{16}$ " wide,  $7\frac{5}{8}$ " high,  $2\frac{5}{8}$ " deep.

Complete information on application.

# HYGROSTATS

## ROOM TYPE FOR TWO POSITION CONTROL



**Uses:** For two position control of motor-operated valves, solenoid valves, compressors, pumps, relays, etc., on humidifying and dehumidifying equipment.

**Construction:** A single-pole, double-throw 3-wire instrument with a multiple hair element. Tension release device assures long life by protecting hair strands from strains caused by extreme humidities. Permanent magnet provides positive snap-action. Fine silver contacts. Calibrated adjustment dial with lock screw.

**Differential:** 2% to 3%.

**Dimensions:** 2" wide, 4" high, 1 5/8" deep.

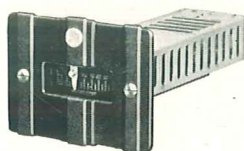
**Electrical Rating:** 2.5 amps. at 25 V.; 1.0 amps. at 115 V. AC.

TYPE  
FYDH 185-1

RANGE  
30% — 70%

CALIBRATED AT  
50%

## DUCT TYPE FOR TWO POSITION CONTROL



**Uses:** For two-position control of motor-operated valves, solenoid valves, compressors, pumps, relays, etc., on humidifying and dehumidifying equipment.

**Construction:** A single-pole, double-throw 3-wire instrument. Multiple hair element. Snap-acting contacts. Tension release device. Ventilated shield protects element and mechanism.

**Differential:** 2% to 3%.

**Dimensions:** Mechanism with shield: 6 1/2" long, 2" wide, 1" high. Duct flange: 3 3/4" wide, 2 7/8" high.

**Electrical Rating:** 2.0 amps. at 25 V.; 0.5 amps at 115 V. AC.

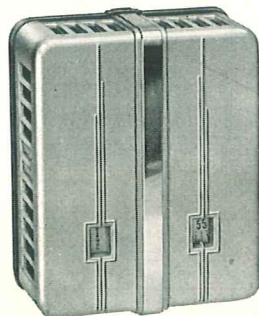
TYPE  
FYDH 188

RANGE  
20% — 70%

CALIBRATED AT  
45%

## ROOM TYPE FOR PROPORTIONING CONTROL

(MICRO-HYGROSTAT)



**Uses:** For proportioning control of relative humidity in comfort and industrial applications where accurate control is required. Used with Barber-Colman proportioning Microvalves, Microtrols, and Micro-Program Switches on humidifying and dehumidifying equipment.

**Construction:** A well ventilated bakelite case houses the sensitive multiple hair element, contacts, adjusting mechanism, and solenoid. Tension device protects hair element from excessive strain. Fine silver contacts. Graduated setting dial visible through viewing window. Key adjustment also available.

**Scale:** 20% to 90%. On applications involving relative humidities over 70%, it is recommended that complete details of the proposed installation be submitted to the factory.

**Electrical Specifications:** For 25 volt 60 cycle AC., only.

**Dimensions:** 3 13/16" wide, 4 9/16" high, 1 13/16" deep.

TYPE  
GYDH 171-1  
GYDH 172-1

CALIBRATED AT  
45%  
60%

DIFFERENTIAL  
1 1/2%  
1 1/2%

ADJUSTMENT  
External  
External



# MOTOR-OPERATED VALVES

## SINGLE SEAT FOR TWO POSITION CONTROL

### GENERAL DESCRIPTION

**Uses:** For two position control of steam, water, gas, oil or brine. Suitable for use on heating and cooling coils, air washers, spray nozzles, zone control systems, hot water storage tanks, boiler feed water control, dryers, heat treating furnaces, process kettles, bottle washers pasteurizers, and industrial process work.

**Control:** Three-wire circuit, single-pole, double-throw switch or its equivalent, such as a thermostat, pressure switch, float switch, or relay.

**Construction:** Valve is a single-seat, packed type, globe screwed, cast iron or brass body with brass trim, tight closing; with renewable composition disc for steam or hot water as standard. Discs for other services furnished when specified. Valve stem is adjustable for minimum bypass applications. Pressure ratings are determined by valve size and type operator used (see table below). For brine service the use of an extended bonnet is recommended. This protects the operator and packing from frost.

### SPECIFICATIONS

#### FOR VALVES WITH YBA OPERATOR

**YBA Operator:** Suitable for use where frequency of operation does not exceed ten operations per hour. 25 volt, 60 cycle, AC., shaded pole induction motor. Control circuit current 2.0 amperes at 25 volts. Bakelite cover. Auxiliary cam operated switches with rating of 2.5 amperes at 25 volts may be used to control additional valves, relays, and signal lights. Operator is detachable as a unit from the valve.

**Timing:** 10 or 20 seconds per stroke. Other timing available on special order.



Globe Screwed Pattern  
with type YBA Operator

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	VOLTAGE	ITEM NUMBER
1/4	100	25	13
3/8	100	25	14
1/2	100	25	15
3/4	100	25	16
1	70	25	17
1 1/4	40	25	18
1 1/2	25	25	19
2	10	25	20

### SPECIFICATIONS

#### FOR VALVES WITH FYBA OPERATOR

**FYBA Operator:** Suitable for use where frequency of operation does not exceed thirty operations per hour. 25 or 115 volt, 60 cycle AC., shaded pole induction motor. Control circuit current 2.2 amperes at 25 volts or 0.5 amperes at 115 volts. Tight fitting metal cover with black crinkle finish. Opening for 1/2" conduit connection provided in base. Auxiliary cam operated switches with rating of 0.5 amperes at 115 volts may be used to control additional valves, relays, and signal lights. Operator is detachable as a unit from the valve.

**Timing:** 35 seconds per stroke. Other timing available on special order.



Globe Screwed Pattern  
with type FYBA Operator

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	VOLTAGE	ITEM NUMBER
1	100	25	185
	100	115	191
1 1/4	100	25	186
	100	115	192
1 1/2	100	25	187
	100	115	193
2	70	25	188
	70	115	194

#### When Ordering Specify:

1. Size and item numbers
2. Media to be controlled
3. Temperature and pressure of media controlled
4. Pressure drop through valve
5. Special features required

For valve capacities see page 33.

**Installation:** May be installed in any position; but mounting with operator upright is preferable.

**Dimensions:** For Roughing-in Dimensions see pages 34 and 35.



# MOTOR-OPERATED VALVES

## SINGLE SEAT, IRON BODY, FOR TWO POSITION CONTROL

### GENERAL DESCRIPTION

**Uses:** For two position control of steam, water, or gas. Used extensively in zone control, on heating and cooling coils, hot water storage tanks, boiler feed water control systems, water lines, dryers, and industrial process work.

**Control:** Three-wire circuit, single-pole, double-throw switch or its equivalent, such as a thermostat, pressure switch, float switch or relay.

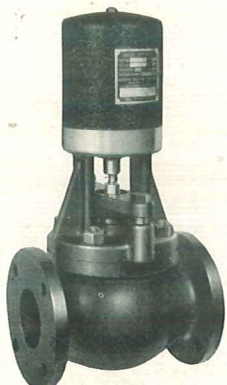
**Construction:** Valve is a single seat packed type with a cast iron body and bronze trim, tight closing, with renewable composition disc for steam or hot water as standard. Discs for other services furnished when specified. Valve stem is adjustable for minimum bypass applications. Pressure ratings are determined by valve size and type operators used (see table below). All sizes are available in either the globe or angle body patterns and with screwed or flanged ends. (Companion flanges are furnished only on special order.)

### SPECIFICATIONS

#### FOR VALVES WITH FYBA OPERATOR

**FYBA Operator:** Suitable for use where frequency of operation does not exceed ten operations per hour. 25 or 115 volt, 60 cycle AC., shaded pole induction motor. Control circuit current 2.2 amperes at 25 volts or 0.5 amperes at 115 volts. Tight fitting metal cover with black crinkle finish. Opening for 1/2" conduit connection provided in base. Auxiliary cam operated switches with rating of 0.5 amperes at 115 volts may be used to control additional valves, relays, and signal lights. Operator is detachable as a unit from the valve.

**Timing:** 95 seconds per stroke. Other timing available on special order.



Globe Flanged Pattern  
with type FYBA Operator

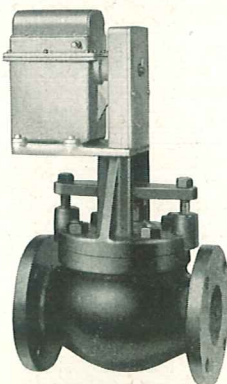
VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	VOLTAGE	ITEM NUMBER
2	70	25	205
		115	210
2½	45	25	206
		115	211
3	30	25	207
		115	212
3½	22	25	208
		115	213
4	16	25	209
		115	214

### SPECIFICATIONS

#### FOR VALVES WITH CYBG OPERATOR

**CYBG Operator:** A heavy duty operator with mechanism completely submerged in oil and sealed in a die cast case. 25 volt, 60 cycle AC., shaded pole induction motor. (115 volt, 60 cycle motor available on special order.) Control circuit current 2.3 amperes at 25 volts. Auxiliary cam operated switches with rating of 2.5 amperes at 25 volts may be used to control additional valves, relays, and signal lights. Operator is detachable as a unit from the valve. Cover includes two 1/2" conduit knockouts.

**Timing:** 95 seconds per stroke. Adjustable speed mechanism to give maximum timing of ten times normal, available on special order.



Globe Flanged Pattern  
with type CYBG Operator

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	VOLTAGE	ITEM NUMBER
2	70	25	370
2½	45	25	371
3	30	25	372
3½	22	25	373
4	16	25	374

#### When Ordering Specify:

1. Size and item number
2. Media to be controlled
3. Temperature and pressure of media controlled
4. Pressure drop through valve
5. Special features required

For valve capacities see page 33.

**Installation:** May be installed in any position, but mounting with operator upright is preferable.

**Dimensions:** For Roughing in Dimensions see pages 34 and 35.



# MOTOR-OPERATED VALVES

## DOUBLE-SEAT, SEMI-BALANCED, FOR TWO POSITION CONTROL

### GENERAL DESCRIPTION

**Uses:** For two position control of steam, water, oil, or gas. 98% tight closing. Suitable for use on zone control, condenser cooling water, heating, and cooling coils. Used primarily on applications where pressure exceeds the rating of single seat valves.

**Control:** Three-wire circuit, single-pole, double-throw switch or its equivalent, such as a thermostat, pressure switch, float switch or relay.

### SPECIFICATIONS — FOR VALVES WITH YBA OPERATOR

**YBA Operator:** Suitable for use where frequency of operation does not exceed ten operations per hour, 25 volt, 60 cycle AC., shaded pole induction motor. Control circuit current 2.0 amperes at 25 volts. Bakelite cover. Auxiliary cam operated switches with rating of 2.5 amperes at 25 volts may be used to control additional valves, relays, and signal lights. Operator is detachable as a unit from the valve.

**Timing:** 10 and 20 seconds per stroke. Other timing available on special order.

**Valve Construction:** Valve is double seat packed type. Bronze body with bronze trim up to 2" in size. 2½" cast iron body with bronze trim. Metal seat and disc. Globe pattern with screwed ends. Valve stem is adjustable.



Globe Screwed Pattern  
with type YBA Operator

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	VOLTAGE	ITEM NUMBER
½	125	25	247
¾	125	25	248
1	125	25	249
1¼	125	25	250
1½	125	25	251
2	125	25	252
2½	125	25	253

### SPECIFICATIONS — FOR VALVES WITH FYBA OPERATORS

**FYBA Operator:** Suitable for use where frequency of operation does not exceed thirty operations per hour. 25 or 115 volt, 60 cycle AC., shaded pole induction motor. Control circuit current 2.2 amperes at 25 volts or 0.5 amperes at 115 volts. Tight fitting metal cover with black crinkle finish. Opening for ½" conduit connection provided in base. Auxiliary cam operated switches with rating of 0.5 amperes at 115 volts may be used to control additional valves, relays, and signal lights. Operator is detachable as a unit from the valve.

**Timing:** 35 seconds per stroke. Other timing available on special order.

**Valve Construction:** Valve is double seat packed type. Cast iron body with bronze trim. Metal seat and disc. Globe screwed pattern in all sizes. Globe flanged 3" and larger. (Companion flanges are furnished only on special order.)



Globe Screwed Pattern  
with type FYBA Operator

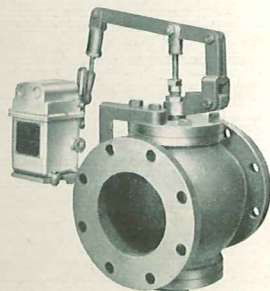
VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	VOLTAGE	ITEM NUMBER
2½	125	25	254
	125	115	261
3	125	25	256
	125	115	263
3½	125	25	257
	125	115	264
4	125	25	258
	125	115	265

### SPECIFICATIONS — FOR VALVES WITH EYCC TYPE OPERATOR

**EYCC Operator:** Mechanism completely submerged in oil and sealed in a die cast base. 25 volt, 60 cycle AC., shaded pole induction motor. (115 volt, 60 cycle motor available on special order.) Control circuit 2.5 amperes at 25 volts. Auxiliary cam operated switches with rating of 2.5 amperes at 25 volts may be used to control additional valves, relays, and signal lights. Operator is detachable as a unit from the valves. Cover includes two ½" conduit knockouts.

**Timing:** 60 seconds per stroke. Adjustable speed mechanism to give maximum timing of ten times normal, available on special order.

**Valve Construction:** Valve body is double seat packed type. Semi-steel body with bronze trim. Monel or stainless steel trim available on special order. Globe pattern with flanged ends. (Companion flanges are furnished only on special order.)



Globe Flanged Pattern  
with type EYCC Operator

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	VOLTAGE	ITEM NUMBER
3	75	25	425
3½	75	25	426
4	75	25	427
5	75	25	428
6	50	25	429
8	50	25	430
10	50	25	431
12	30	25	432

#### When Ordering Specify:

1. Size and item number
2. Media to be controlled
3. Temperature and pressure of media controlled
4. Pressure drop through valve
5. Special features required

For valve capacities see page 33.

**Installation:** May be installed in any position, but mounting with operator upright is preferable.

**Dimensions:** For Roughing in Dimensions see pages 34 and 35.



# MOTOR-OPERATED VALVES

## SINGLE SEAT, PILOT PISTON, FOR TWO POSITION CONTROL

### GENERAL DESCRIPTION

**Uses:** For two position control of steam, air, or water. Tight closing. Suitable for use on heating and cooling coils, spray nozzles, air lines, boiler feed water control, and other high pressure applications where tight closing is required.

**Control:** Three-wire circuit, single-pole, double-throw switch or its equivalent, such as a thermostat, pressure switch, float switch, or relay.

### SPECIFICATIONS — FOR VALVES WITH YBA OPERATOR

**YBA Operator:** Suitable for use where frequency of operation does not exceed ten operations per hour. 25 volt, 60 cycle AC., shaded pole induction motor. Control circuit current 2.0 amperes at 25 volts. Bakelite cover. Auxiliary cam operated switches with rating of 2.5 amperes at 25 volts may be used to control additional valves, relays, and signal lights. Operator is detachable as a unit from the valve. Timing 10 and 20 seconds per stroke. Other timing available on special order.

**Valve Construction:** Valve is single seat, pilot operated, packed type. Bronze body with bronze trim. Globe pattern screwed ends. Metal disc for steam and air. Composition disc for water.



Globe Screwed Pattern  
with type YBA Operator

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	VOLTAGE	ITEM NUMBER
1/2	150	25	61
3/4	150	25	62
1	150	25	63
1 1/4	150	25	64*
1 1/2	150	25	65*

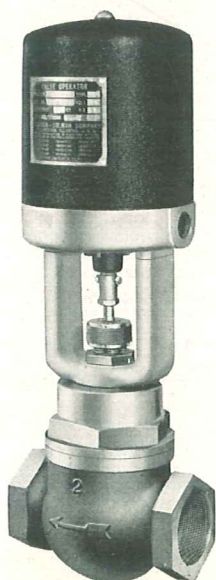
\*For water service only.

### SPECIFICATIONS — FOR VALVES WITH FYBA OPERATOR

**FYBA Operator:** Suitable for use where frequency of operation does not exceed thirty operations per hour. 25 or 115 volts, 60 cycle AC., shaded pole induction motor. Control circuit current 2.2 amperes at 25 volts or 0.5 amperes at 115 volts. Tight fitting metal cover with black crinkle finish. Opening for 1/2" conduit connection provided in base. Auxiliary cam operated switches with rating of 0.5 amperes at 115 volts may be used to control additional valves, relays, and signal lights. Operator is detachable as a unit from the valve.

**Timing:** 35 seconds per stroke. Other timing available on special order.

**Valve Construction:** Valve is single seat, pilot operated, packed type. Bronze body, bronze trim, 1 1/4" to 2", inclusive. Cast iron body with bronze trim 2 1/2" to 4". Globe pattern screwed ends 1 1/4" to 4". Globe pattern flanged ends 3", 3 1/2" and 4". (Companion flanges are furnished only on special order.)



Globe Screwed Pattern  
with type FYBA Operator

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	VOLTAGE	ITEM NUMBER
1 1/4	150	25	245
	150	115	246
1 1/2	150	25	197
	150	115	201
2	150	25	198
	150	115	202
2 1/2	150	25	468
	150	115	470
3	125	25	469
	125	115	471
3 1/2	125	25	407
	125	115	409
4	125	25	408
	125	115	410

#### When Ordering Specify:

1. Size and item numbers
2. Media to be controlled
3. Temperature and pressure of media controlled
4. Pressure drop through valve
5. Special features required

For valve capacities see page 33.

**Installation:** May be installed in any position, but mounting with operator upright is preferable.

**Dimensions:** For Roughing in Dimensions see pages 34 and 35.



# MOTOR-OPERATED VALVES

## DOUBLE SEAT, 3-WAY, FOR TWO POSITION CONTROL

### GENERAL DESCRIPTION

**Uses:** For two position control of steam, water, oil, or gas in switching or bypass applications. One inlet with two outlets. Suitable for use on air conditioning systems and process control to bypass around heating coils, cooling coils, and water chillers.

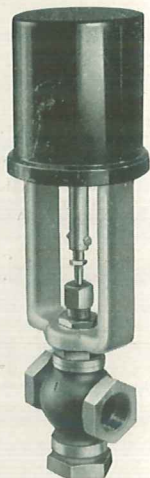
**Control:** Three-wire circuit, single-pole, double-throw switch or its equivalent, such as a thermostat, pressure switch, float switch, or relay.

### SPECIFICATIONS — FOR VALVES WITH YBA OPERATOR

**YBA Operator:** Suitable for use where frequency of operation does not exceed ten operations per hour. 25 volt, 60 cycle AC., shaded pole induction motor. Control circuit current 2.0 amperes at 25 volts. Bakelite cover. Auxiliary cam operated switches with rating of 2.5 amperes at 25 volts may be used to control additional valves, relays, and signal lights. Operator is detachable as a unit from the valve.

**Timing:** 10 and 20 seconds per stroke. Other timing available on special order.

**Valve Construction:** Valve is double seat packed type. Bronze body, screwed ends, with bronze trim-tight seating. Metal seat and disc. Valve stem is adjustable. Pressure ratings are determined by valve size (see table below).



Globe Screwed Pattern  
with Type YBA Operator

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	VOLTAGE	ITEM NUMBER
1/2	125	25	131
3/4	100	25	132
1	70	25	133
1 1/4	40	25	134
1 1/2	25	25	135
2	10	25	136

### SPECIFICATIONS — FOR VALVES WITH FYBA & CYBC OPERATORS

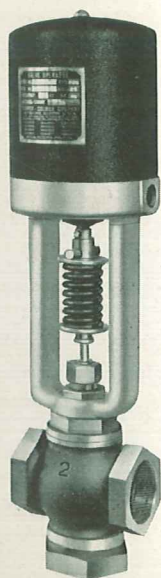
**FYBA Operator:** Suitable for use where frequency of operation does not exceed thirty operations per hour. 25 or 115 volt, 60 cycle AC., shaded pole induction motor. Control circuit 2.2 amperes at 25 volts or 0.5 amperes at 115 volts. Tight fitting metal cover with black crinkle finish. Opening for 1/2" conduit connection provided in base. Auxiliary cam operated switches with rating of 0.5 amperes at 115 volts may be used to control additional valves, relays, and signal lights. Operator is detachable as a unit from the valve.

**Timing:** 35 seconds per stroke. Other timing available on special order.

**CYBC Operator:** Heavy duty operator for use on large valves. Motor and gear reduction submerged in oil. 25 volt, 60 cycle AC., shaded pole induction motor. Control circuit is 2.2 amperes at 25 volts.

**Timing:** 75 seconds per stroke. Adjustable speed mechanism to give maximum timing of ten times normal available on special order.

**Valve Construction:** Valve is double seated, packed type. 2" is bronze body, screwed ends, with bronze trim. 2 1/2" to 4" cast iron body, screwed or flanged ends. All valves tight seating. Metal seat and disc. Valve stem is adjustable. Pressure ratings are determined by valve size (see table below). (Companion flanges for flanged end valves furnished only on special order.)



Globe Screwed Pattern  
with Type FYBA Operator

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	VOLTAGE	ITEM NUMBER
2	70	25	218
	70	115	223
2 1/2	45	25	219
	45	115	224
3	35	25	145
3 1/2	25	25	146
4	18	25	147

#### When Ordering Specify:

1. Size and item number
2. Media to be controlled
3. Pressure drop through valve
4. Temperature and pressure of media controlled
5. Special features required

For valve capacities see page 33.

**Installation:** May be installed in any position, but mounting with operator upright is preferable.

**Dimensions:** For Roughing in Dimensions see pages 34 and 35.



## MOTOR-OPERATED VALVES

### PACKLESS RADIATOR VALVES FOR TWO POSITION CONTROL



Angle Radiator Pattern

#### GENERAL DESCRIPTION

**Uses:** For two position control of low pressure steam, air, or gas. Tight closing. Used primarily for the control of steam radiation in office buildings, residences, schools, auditoriums, hospitals, etc. Also used on unit heaters, low pressure steam humidifiers, unit ventilators, and some types of gas fired industrial furnaces.

**Control:** Three-wire circuit, single-pole, double-throw thermostat or its equivalent. Auxiliary cam-operated switches with rating of 2.5 amperes may be used to control additional valves, or relays, signal lights, etc.

**Construction:** Single seat, packless type, with nickel plated brass body and brass trim. Metal bellows. Renewable composition disc for steam standard. Disc for air or gas available. Maximum pressure rating for all sizes, 10 lbs. per sq. in.

**Motor Operator:** Powered by Barber-Colman shaded pole induction motor, with gear reduction of precision hobbled gears. Operator detachable as a unit.

**Body Types:** Straight through, off-set and angle pattern bodies. All screwed ends.

#### SPECIFICATIONS

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	TIMING SECS./STROKE	VOLTAGE	ITEM NUMBER
1/2	10	15	25	1
3/4	10	15	25	2
1	10	18	25	3
1 1/4	10	18	25	4
1 1/2	10	18	25	5
2	10	18	25	6

#### When Ordering Specify:

1. Size, item number, and body type
2. Media to be controlled

**Installation:** May be installed in any position, but mounting with operator upright is preferable.

**Dimensions:** For Roughing in Dimensions see pages 34 and 35

### CHEMICAL VALVES FOR TWO POSITION CONTROL

#### GENERAL DESCRIPTION



**Uses:** For the control of corrosive fluids, gases, or liquids containing suspended solids. Suitable for use on liquid level control of tanks and vats, density or level control of solutions in evaporators and flow control of chemicals used in treatment of water, sewage and boiler feed water.

**Control:** Three-wire single-pole, double-throw switch or its equivalent, such as float switch, pressure switch, recording controller, or push button station.

**Valve Body Construction:** Hills-McCanna Saunders Patent Valve body. Upper part of body contains operating mechanism completely separated from the liquid by a diaphragm. Diaphragms are tough, resilient and resistant to the fluids handled. Bodies can be of alloys, or cast iron lined with lead, rubber, or glass.

**Motor Operator:** Heavy duty FYBA type, 115 or 230 volt, 60 cycle AC. Shaded pole induction motor. Control circuit 0.5 amperes at 115 volts.

**Sizes:** 1/2" to 1 1/4" inclusive, screwed or flanged ends.

**Differential Pressure:** Pressure differential against which valve will close is determined by the type of diaphragm required for the liquid being controlled. Maximum temperature of fluids handled by this valve is 200°F.

#### When Ordering Specify:

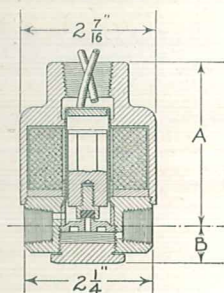
1. Valve size
2. Body type
3. Body material
4. Voltage and frequency
5. Pressure of media controlled
6. Temperature of media controlled
7. Description of liquid
8. Degree of concentration



# SOLENOID VALVES

## SINGLE SEAT AND PILOT OPERATED FOR TWO POSITION CONTROL

### GENERAL DESCRIPTION



**Uses:** For two position control of air or water at temperatures not exceeding 150°F. Tight closing. Used primarily on spray humidifiers.

**Valve Body:** Single seat zinc plated brass body with renewable bronze seat. Disc holder assembly with synthetic rubber disc may be replaced without removing valve body from line.

**Solenoid Construction:** Double-enameled copper wire coil is enclosed in a cast iron housing with black crinkle finish. Coil assembly replaceable without removing valve from line. Stainless iron, floating type armature moves in seamless copper alloy tube clamped into the valve body.

**Control:** Two wire. Valve opens when solenoid is energized, and closes when circuit is broken. May be controlled from a two-wire thermostat, float switch, single-pole single-throw switch, or equivalent.

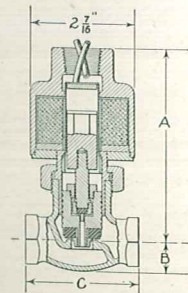
**Power Requirements:** 25 or 115 Volt, 60 cycle standard. Solenoids for other voltages and frequencies, as well as DC, are available on special order. Input is 12 watts.

**Installation:** Must be mounted in an upright position with line pressure on top of disc. A fine mesh strainer should be installed ahead of the valve.

### SPECIFICATIONS

PIPE SIZE	PORT	MAXIMUM PRESSURE LBS./SQ. IN.	VOLTS	CYCLES	TYPE	DIMENSIONS	
						A	B
1/4"	3/32"	100	115	60	BYBS 701	3"	2 1/32"
	"	"	25	"	BYBS 702	"	"
3/8"	3/32"	100	115	60	BYBS 703	3"	2 1/32"
	"	"	25	"	BYBS 704	"	"

### GENERAL DESCRIPTION



**Uses:** For two position control of high pressure air or water at temperatures not exceeding 150°F. Tight closing. Used primarily on spray humidifiers.

**Valve Construction:** Single seat brass body with seat ring integral with body. Renewable composition disc. Pilot operated. When coil is energized, pilot valve opens first, releasing pressure above disc holder, then piston disc assembly is raised to open position. Valve is closed by gravity and line pressure when coil is de-energized.

**Solenoid Construction:** Double-enameled copper wire coil is enclosed in a cast iron housing with black crinkle finish. Coil assembly replaceable without removing valve from line. Stainless iron, floating type armature moves in seamless copper alloy tube clamped into the valve body.

**Control:** Two wire. Valve opens when solenoid is energized, and closes when circuit is broken. May be controlled from a two-wire thermostat, float switch, single-pole single-throw switch, or equivalent.

**Power Requirements:** 25 or 115 Volt, 60 cycle standard. Solenoids for other voltages and frequencies, as well as DC, are available on special order. Input is 12 watts.

**Installation:** Must be mounted in an upright position with line pressure on top of disc. A fine mesh strainer should be installed ahead of the valve.

### SPECIFICATIONS

PIPE SIZE	PORT	MAXIMUM PRESSURE LBS./SQ. IN.	VOLTS	CYCLES	TYPE	DIMENSIONS		
						A	B	C
1/2"	1/2"	20 to 100	115	60	DYBS 721	4 1/4"	25 3/32"	2 1/16"
	"	"	25	"	DYBS 722	"	"	"
3/4"	3/4"	20 to 100	115	60	DYBS 723	4 1/2"	1"	3 3/16"
	"	"	25	"	DYBS 724	"	"	"



# MOTOR-OPERATED VALVES

SINGLE SEAT, V-PORTED, FOR PROPORTIONING CONTROL

## GENERAL DESCRIPTION

**Uses:** For proportioning control of steam, water, oil or gas. Tight closing. Suitable for low pressure service on blast system coils, dryers, pasteurizers, kettles, process work, and other applications in which close regulation is required.

**Control:** Barber-Colman Microtherm or Micro-Hygrostat. Rheostat in operator energizes Microtherm solenoid, which exerts pull on contact tongue to position operator in accordance with load demand. May also be positioned from manual rheostat and Polarized Microrelay, or from proportioning type controllers using potential sensitive relays. Auxiliary cam-operated switches with rating of 2.5 amperes at 25 volts may be used to control additional valves, relays, signal lights, etc.

## SPECIFICATIONS — FOR VALVES WITH BYBG M OPERATOR



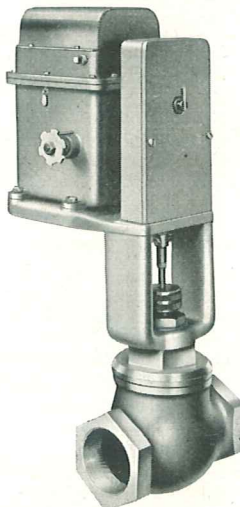
Globe Screwed Pattern  
with type BYBG M  
Operator

**BYBG M Operator:** A fixed speed operator powered by a Barber-Colman shaded pole induction motor through a reduction of machine-cut gears with all steel gears heat treated. A hardened steel eccentric cam mounted on output shaft operates valve plunger. Cam-operated switches stop operator at end of stroke. Internal potential dividing rheostat with contact arm driven directly from the power output shaft. Mechanism protected by metal cover with two 1/2" conduit knockouts. Motor input 1.1 amperes at 25 volts. Control circuit current 0.30 amperes.

**Valve Construction:** Single seat, packed type, with V-Ported throttling nut. Flow proportional to the amount of opening of the valve. Renewable composition disc for steam or hot water standard. Disc for other service furnished when specified. Bronze body with bronze trim, globe pattern screwed ends. Adjustable valve stem.

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	TIMING SECS./STROKE	ITEM NUMBER
1/2	15	150	442 M
3/4	15	150	443 M
1	15	150	444 M
1 1/4	15	150	462 M
1 1/2	15	150	463 M
2	15	150	464 M

## SPECIFICATIONS — FOR VALVES WITH CYBG M OPERATOR



Globe Screwed Pattern  
with type CYBG M  
Operator

**CYBG M Operator:** A heavy duty operator with mechanism completely submerged in oil and sealed in a die cast case, insuring long life with a minimum of service. Adjustable speed feature provides a maximum timing of approximately ten times normal. Powered by a Barber-Colman shaded pole induction motor with a gear reduction of machine-cut, heat treated gears. Hardened steel eccentric cam mounted on output shaft operates valve plunger. Cam-operated switches stop operator at end of stroke. Internal potential dividing rheostat with contact arm driven directly from the power output shaft. Cover includes two 1/2" conduit knockouts. Motor input 2.3 amperes at 25 volts. Control circuit current 0.48 amperes. (115 volt, 60 cycle motor available on special order).

**Valve Construction:** Single seat, packed type, with V-Ported throttling nut. Flow proportional to the amount of opening of the valve. Renewable composition disc for steam or hot water standard. Disc for other service furnished when specified. Bronze body with bronze trim, globe pattern screwed ends, in sizes 1/2" to 2" inclusive. Cast iron body with bronze trim, globe pattern screwed ends, in 2 1/2" size. Adjustable valve stem.

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	TIMING SECS./STROKE	ITEM NUMBER
1/2	15	115 — 1150	445 M
3/4	15	115 — 1150	446 M
1	15	115 — 1150	447 M
1 1/4	15	115 — 1150	448 M
1 1/2	15	115 — 1150	449 M
2	15	115 — 1150	467 M
2 1/2	15	115 — 1150	376 M

Oil submerged operators are available without rheostats for use on floating control applications. Omit suffix "M" from Item Number; for example, Item 445.

### When Ordering Specify:

1. Size and item number
2. Media to be controlled
3. Temperature and pressure of media controlled
4. Pressure drop through valve
5. Special features required

For valve capacities see page 33.

**Installation:** May be installed in any position, but mounting with operator upright is preferable.

**Dimensions:** For Roughing in Dimensions see pages 34 and 35.



# MOTOR-OPERATED VALVES

## DOUBLE SEAT, V-PORTED, FOR PROPORTIONING CONTROL

### GENERAL DESCRIPTION

**Uses:** For proportioning control of steam, water, oil, or gas. 98% tight closing. Suitable for use on blast system coils, dryers, pasteurizers, kettles, process work, and other applications in which close regulation is required.

**Control:** Barber-Colman Microtherm or Micro-Hygrostat. Rheostat in operator energizes Microtherm solenoid, which exerts pull on contact tongue to position operator in accordance with load demand. May also be positioned from manual rheostat and Polarized Microrelay, or from proportioning type controllers using potential sensitive relays. Auxiliary cam-operated switches with rating of 2.5 amperes at 25 volts may be used to control additional valves, relays, signal lights, etc.

### SPECIFICATIONS — FOR VALVES WITH BYBG M OPERATOR

**BYBG M Operator:** A fixed speed operator powered by a Barber-Colman shaded pole induction motor through a reduction of machine-cut gears with all steel gears heat treated. A hardened steel eccentric cam mounted on output shaft operates valve plunger. Cam-operated switches stop operator at end of stroke. Internal potential dividing rheostat with contact arm driven directly from the power output shaft. Mechanism protected by metal cover with two 1/2" conduit knockouts. Motor input 1.1 amperes at 25 volts. Control circuit current 0.30 amperes.

**Valve Construction:** Double seat, packed type, with V-Ported disc. Flow proportional to the amount of opening of the valve. Metal seat and disc. Bronze body, globe pattern screwed ends, with bronze trim in sizes 1/2" to 2" inclusive. Cast iron body, globe pattern screwed ends, with bronze trim in 2 1/2" size. Adjustable valve stem.



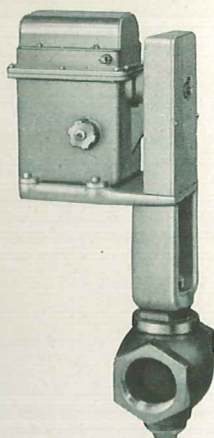
Globe Screwed Pattern  
with type BYBG M  
Operator

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	TIMING SECS./STROKE	ITEM NUMBER
1/2	125	150	324 M
3/4	125	150	325 M
1	125	150	326 M
1 1/4	125	150	327 M
1 1/2	125	150	328 M
2	125	150	465 M
2 1/2	125	150	466 M

### SPECIFICATIONS — FOR VALVES WITH CYBG M OPERATOR

**CYBG M Operator:** A heavy duty operator with mechanism completely submerged in oil and sealed in a die cast base, insuring long life with a minimum of service. Adjustable speed feature provides a maximum timing of approximately ten times normal. Powered by a Barber-Colman shaded pole induction motor with a gear reduction of machine-cut, heat treated gears. Hardened steel eccentric cam mounted on output shaft operates valve plunger. Cam-operated switches stop operator at end of stroke. Internal potential dividing rheostat with contact arm driven directly from the power output shaft. Cover includes two 1/2" conduit knockouts. Motor input 2.3 amperes at 25 volts. Control circuit current 0.48 amperes. (115 volt, 60 cycle motor available on special order).

**Valve Construction:** Double seat, packed type, with V-Ported disc. Flow proportional to the amount of opening of the valve. Metal seat and disc. Bronze body with bronze trim in sizes 1/2" to 2" inclusive. Cast iron body with bronze trim in 2 1/2" and 3" sizes. Globe pattern screwed ends. Adjustable valve stem.



Globe Screwed Pattern  
with type CYBG M  
Operator

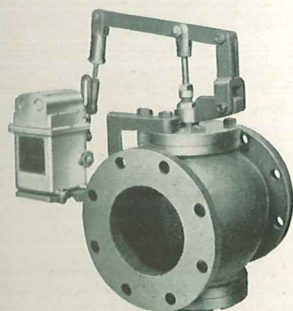
VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	TIMING SECS./STROKE	ITEM NUMBER
1/2	125	115 — 1150	450 M
3/4	125	115 — 1150	451 M
1	125	115 — 1150	380 M
1 1/4	125	115 — 1150	381 M
1 1/2	125	115 — 1150	382 M
2	125	115 — 1150	383 M
2 1/2	125	115 — 1150	384 M
3	125	115 — 1150	396 M

Oil submerged operators are available without rheostats for use on floating control applications. Omit suffix "M" from Item Number; for example, Item 450.

### SPECIFICATIONS — FOR VALVES WITH EYCC M OPERATOR

**EYCC M Operator:** Mechanism completely submerged in oil and enclosed in oil tight die cast case. Adjustable speed. Powered by Barber-Colman shaded pole induction motor. Maximum ambient temperature 150°F. Motor input 2.3 amperes at 25 volts AC. Control current 0.46 amperes. Motor operator detachable as a unit. (115 Volt, 60 cycle motor available on special order).

**Valve Construction:** Double seat, packed type, with V-Ported disc. Flow proportional to the amount of opening of the valve. Metal seat and disc. Semi-steel body with bronze trim. Monel or stainless steel trim available on special order. Globe flanged pattern. (Companion flanges are furnished only on special order.) Adjustable valve stem.



Globe Flanged Pattern  
with type EYCC M  
Operator

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	TIMING SECS./STROKE	ITEM NUMBER
3	75	115 — 1150	434 M
3 1/2	75	115 — 1150	435 M
4	75	115 — 1150	436 M
5	75	115 — 1150	437 M
6	50	115 — 1150	438 M
8	50	115 — 1150	439 M
10	50	115 — 1150	440 M
12	30	115 — 1150	441 M

Operators are available without rheostats for use on floating control applications. Omit suffix "M" from Item Number; for example, Item 434.



# MOTOR-OPERATED VALVES

## THREE WAY FOR PROPORTIONING CONTROL

### GENERAL DESCRIPTION

**Uses:** For proportioning control of steam, water, oil, or gas in mixing or bypass applications. Used extensively in air conditioning systems to bypass around heating coils, cooling coils, heat exchangers, boilers, water chillers, etc. Also used as a mixing valve on hot water heating installations and similar applications.

**Control:** Barber-Colman Microtherm. Rheostat in operator energizes Microtherm solenoid, which exerts pull on contact tongue to position operator in accordance with heat demand. May also be positioned from manual rheostat and Polarized Microrelay, or from proportioning type controllers using potential sensitive relays. Auxiliary cam-operated switches with rating of 2.5 amperes at 25 volts may be used to control additional valves, relays, signal lights, etc.

### SPECIFICATIONS — FOR VALVES WITH BYBG M OPERATOR

**BYBG M Operator:** Not oil submerged. Fixed speed. Suitable for use on small valves. Metal cover with two 1/2" conduit knockouts. Motor input 1.1 amperes at 25 volts. Control circuit current 0.30 amperes.

**Valve Construction:** Double seat, packed type, with metal seat and disc. Tight seating. Adjustable valve stem. Pressure rating determined by valve size and type of operator. Bronze body, screwed end pattern, with bronze trim in sizes 1/2" to 2" inclusive. Valve stem adjustable.



Globe Screwed Pattern  
with type BYBG M  
Operator

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	TIMING SECS./STROKE	ITEM NUMBER
1/2	125	150	318 M
3/4	100	150	319 M
1	70	150	320 M
1 1/4	40	150	321 M
1 1/2	25	150	322 M

### SPECIFICATIONS—FOR VALVES WITH CYBG M AND CYBC M OPERATORS

**CYBG M Operator:** Heavy duty operator with mechanism completely submerged in oil and enclosed in oil-tight die cast case. Adjustable speed. Bakelite terminal block and metal cover with two 1/2" conduit knockouts. Motor input 2.3 amperes at 25 volts. Control circuit current 0.48 amperes. (115 volt, 60 cycle operator available on special order.)

**CYBCM Operator:** Heavy duty operator for use on large valves. Motor and gear reduction submerged in oil. Adjustable speed. Maximum ambient temperature 150°F. Motor input 2.8 amperes at 25 volts. Control circuit current 0.48 amperes. (115 volt, 60 cycle operator available on special order.)

**Valve Construction:** Double seat, packed type, with metal seat and disc. Tight seating. Adjustable valve stem. Pressure rating determined by valve size and type of operator. Bronze body, screwed end pattern, with bronze trim in 2" size. Cast iron body with bronze trim in 2 1/2" to 4" sizes, globe pattern, 2 1/2", 3" screwed ends, 3 1/2", 4" flanged ends. (Companion flanges furnished only on special order.) Valve stem adjustable.



Globe Screwed Pattern  
with type CYBG M  
Operator

VALVE SIZE IN INCHES	MAXIMUM PRESSURE LBS./SQ. IN.	TIMING SECS./STROKE	ITEM NUMBER
2	70	115 — 1150	389 M
2 1/2	45	115 — 1150	390 M
3	35	275 — 2750	149 M
3 1/2	25	275 — 2750	150 M
4	18	275 — 2750	151 M

#### When Ordering Specify:

1. Size and item number
2. Media to be controlled
3. Temperature and pressure of media controlled
4. Pressure drop through valve
5. Special features required

For valve capacities see page 33.

**Installation:** May be installed in any position, but mounting with operator upright is preferable.

**Dimensions:** For Roughing in Dimensions see pages 34 and 35



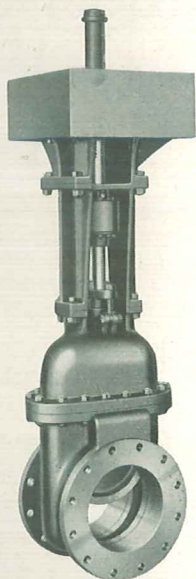
# MOTOR-OPERATED INDUSTRIAL VALVES

## SANITARY VALVES



These Motor-Operated Valves are designed to serve the dairy, processed food products, beverage, and chemical industries in a multitude of important applications. They are available with bodies of sanitary construction in a variety of corrosion resistant alloys, and with motor operators suitable for use with practically all automatic controlling devices.

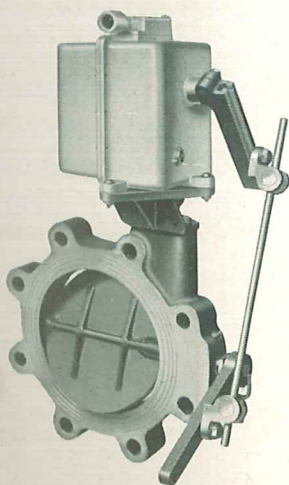
Complete information available on application.



## GATE VALVES

The Barber-Colman Motor-Operated Gate Valve is a Crane wedge disc gate valve body operated by a fractional horse-power motor and gear reduction. The valve is tight closing and has been designed for throttling and proportioning control of high pressure steam, water, or gas. It may also be used for 2-position control.

Standard sizes are 6", 8", 10" and 12". Complete information available on application.



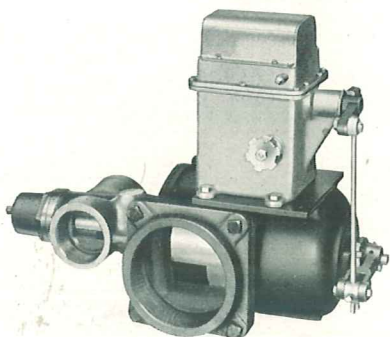
## BUTTERFLY VALVES

Motor-Operated Butterfly Valves with Barber-Colman operators are available to provide industry with a compact, low pressure valve for handling air, gas, vapors, and liquids. It can be installed in new or old piping with a minimum of effort and expense. It is no thicker than a pair of pipe flanges and is stronger and more rugged than the conventional double type flanged valve. The valve body is secured between the flanges by through bolts. A packing gland on the stem and sealing grooves in each face prevent leakage.

Butterfly Valves are available in sizes from 2" to 24". Complete information available on application.

## MOTOR-OPERATED INDUSTRIAL VALVES

### ADJUSTABLE PORT VALVES



Adjustable Port Valves with Barber-Colman operators are available for those applications requiring a definite minimum and maximum flow of a medium and where it is necessary to vary that flow intermittently or continuously between these limits. They can be used singly or in pairs when simultaneous and proportional control of two mediums is advantageous.

Adjustable Port Valves are available for use on gas, oil, air, and steam or in combinations for gas-air and oil-air.

Sizes range from  $\frac{3}{8}$ " to 6". Complete information available on application.

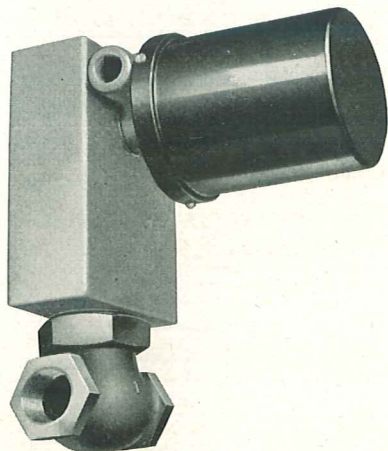
### SELF-CLOSING OIL VALVES



The Motor-Operated Self-Closing Valve has been designed for the control of fuel oil on applications where automatic closing on current failure is desirable. It is particularly suitable for service on heavy fuel oil where solenoid valves are unsatisfactory.

Although the valve is designed primarily for fuel oil service, it may also be used to handle any liquid which will not attack the disc, seat, or body material, and which will provide sufficient lubrication to prevent scoring between the seat and disc.

Complete information available on application.



### SELF-CLOSING VALVES

Motor-Operated Self-Closing Valves are available for the control of gas, steam, air, water or light oil on industrial applications where high pressures are encountered and automatic closing on power failure is desirable.

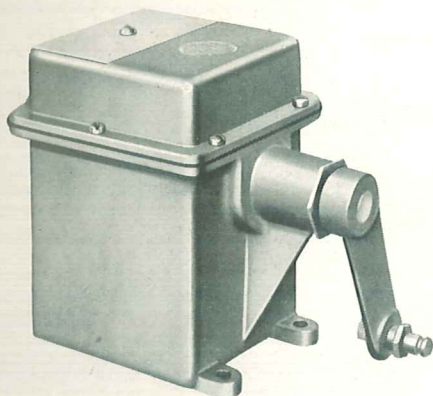
Motor-Operated Self-Closing Valves are available in sizes from  $\frac{1}{2}$ " to  $1\frac{1}{2}$ ".

Complete information available on application.



## CONTROL MOTORS

### SPRING RETURN TYPE FOR TWO POSITION CONTROL



**Uses:** For two position operation of small dampers. Usually wired in series with fan motor to open fresh air or exhaust damper whenever fan is running.

**Construction:** A Barber-Colman stall type motor drives the main shaft through a gear reduction of machine-cut, heat-treated gears. Operating mechanism is submerged in oil and sealed in a die cast case. Crank arm with  $2\frac{5}{8}$ " centers pressed on main shaft. Cover includes  $\frac{5}{16}$ " flexible conduit connection.

**Power Requirements:** AC., only, 115 and 230 volt, 60 cycle standard. Motors for lower voltages and frequencies available on special order. Timing of 25 cycle motor approximately three times that of corresponding 60 cycle unit. Input is 50 VA.

**Control:** Two wire. When energized, motor rotates until stalled. Spring or weight returns control motor to original position when power is shut off. Approximately 8 lbs. in torque required to back up motor. Spring included with each motor.

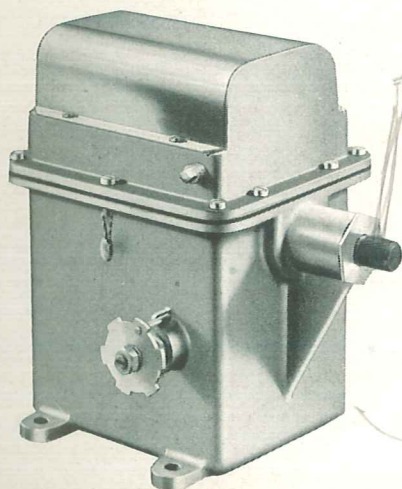
**Installation:** Should be mounted upright. For longest life, maximum ambient temperature should not exceed 150°F.

**Dimensions:** Approximately 4" wide x 5" high x  $5\frac{3}{4}$ " long. (See page 29 for linkage.)

### SPECIFICATIONS

TYPE	VOLTS	CYCLES	TIMING SECS./360° NO LOAD	TORQUE LB. IN.	MAXIMUM DAMPER SIZE SQ. FT.
CYCH 625	115	60	8	20	8
CYCH 627	230	60	8	20	8

### FIVE POSITION TYPE



**Uses:** For five position operation of dampers. Usually used in connection with 5-Point switch to position fresh air damper. May also be used for two position or floating control between any two points.

**Construction:** Oil submerged. A Barber-Colman reversible shaded pole induction motor drives the main shaft through a gear reduction of machine-cut, heat-treated gears. Cam operated switches stop motor at end of stroke and intermediate positions. Entire operating mechanism is completely submerged in oil, and sealed in a die cast case, insuring long life with a minimum of service. Adjustable speed units have a maximum timing of approximately ten times normal. Bakelite terminal block with large coded terminals. Cover includes two  $\frac{1}{2}$ " conduit knockouts. Shaft diameter  $\frac{1}{2}$ ".

**Power Requirements:** AC., only. 25 volt, 60 cycle standard. Motors for other frequencies available on special order. Timing of 25 cycle motors approximately three times that of corresponding 60 cycle units. Motor input 2.3 amperes.

**Control:** 5-Point switch. Single-pole double-throw switch, or its equivalent, may be used to control between any two points. Control circuit current 0.46 amperes.

**Installation:** May be installed in any position, but upright mounting is preferable. For longest life, maximum ambient temperature should not exceed 150°F.

**Dimensions:** Approximately  $5\frac{3}{8}$ " wide x  $7\frac{1}{4}$ " high x 7" long. (See page 29 for linkage.)

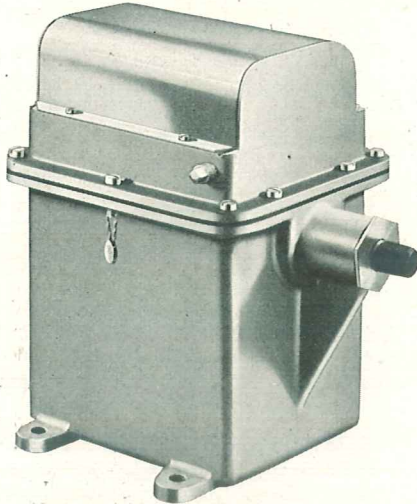
### SPECIFICATIONS

TYPE	LIMITS OF TRAVEL	SPEED	TIMING SECS./360°	TORQUE LB. IN.	MAXIMUM DAMPER SIZE SQ. FT.
EYCC 522-1	180°	Fixed	225	220	75
EYCC 535-1	"	Adj.	225 — 2250	"	"
EYCC 531-1	90°	Fixed	225	220	75
EYCC 536-1	"	Adj.	225 — 2250	"	"



## CONTROL MOTORS

### OIL-SUBMERGED TYPE FOR TWO POSITION CONTROL



**Uses:** For two position operation of dampers. Also used in industrial applications such as operation of air and gas valves.

**Construction:** A Barber-Colman shaded pole induction motor drives the main shaft through a gear reduction of machine-cut, heat-treated gears. Cam-operated limit switches stop motor at end of stroke. Entire operating mechanism is completely submerged in oil and sealed in a die cast case, insuring long life with a minimum of service. Adjustable speed units with a timing of approximately ten times normal available on special order. Bakelite terminal block with large coded terminals. Cover includes two  $\frac{1}{2}$ " conduit knockouts. Shaft diameter  $\frac{1}{2}$ ".

**Power Requirements:** AC., only. 25 volt, 60 cycle standard. Motors for other frequencies available on special order. Timing of 25 cycle motor approximately three times that of corresponding 60 cycle unit.

**Control:** Three-wire circuit. Single-pole double-throw switch or its equivalent, such as a thermostat, hygostat, or relay. Control circuit current 2.3 amperes. Auxiliary cam operated switches with rating of 2.5 amperes at 25 volts may be used to control additional motors, relays, signal lights, etc.

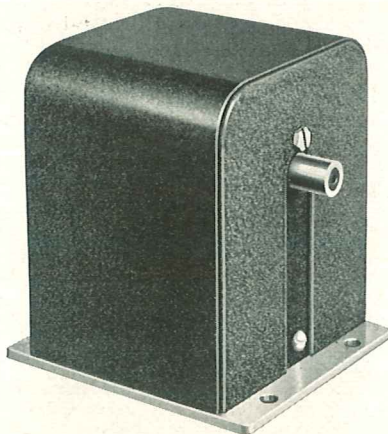
**Installation:** May be installed in any position, but upright mounting is preferable. For longest life, maximum ambient temperature should not exceed 150°F.

**Dimensions:** Approximately  $5\frac{3}{8}$ " wide x  $7\frac{1}{4}$ " high x 7" long. (See page 29 for linkage.)

### SPECIFICATIONS

TYPE	LIMITS OF TRAVEL	TIMING SECS./360°	TORQUE LB. IN.	MAXIMUM DAMPER SIZE SQ. FT.
EYCC 503-1	180°	120	175	50
EYCC 505-1	180°	44	80	30

### LIGHT DUTY TYPE FOR TWO POSITION CONTROL



**Uses:** For two position operation of dampers.

**Construction:** A Barber-Colman shaded pole induction motor drives the main shaft through a reduction of machine-cut gears. All steel gears are heat treated. Cam-operated limit switches stop motor at end of stroke. Mechanism protected by metal cover with black crinkle finish. Cover includes two  $\frac{1}{2}$ " conduit knockouts. Shaft diameter  $\frac{1}{2}$ ".

**Power Requirements:** AC., only. 25 volt, 60 cycle standard. Motors for other frequencies available on special order. Timing of 25 cycle motor approximately three times that of corresponding 60 cycle unit.

**Control:** Three-wire circuit, single-pole double-throw switch, or its equivalent, such as a thermostat, hygostat, or relay. Control circuit current 0.8 amperes. Auxiliary cam-operated switches with rating of 2.5 amperes at 25 volts may be used to control additional motors, relays, signal lights, etc.

**Installation:** May be installed in any position. For longest life, maximum ambient temperature should not exceed 115°F.

**Dimensions:** Approximately 4" wide x  $4\frac{3}{4}$ " high x  $4\frac{3}{8}$ " long. (See page 29 for linkage.)

### SPECIFICATIONS

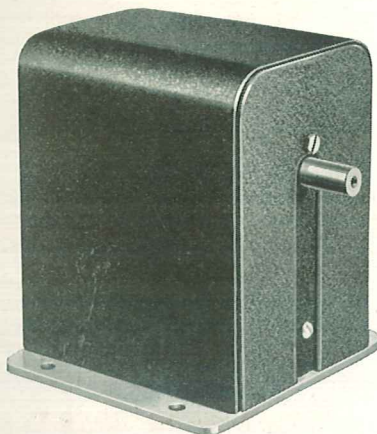
TYPE	LIMITS OF TRAVEL	TIMING SECS./360°	TORQUE LB. IN.	MAXIMUM DAMPER SIZE SQ. FT.
AYCG 650-1	180°	150	45	15
AYCG 635-1*	90°	150	45	15

\*For direct connection to butterfly damper without stops. Damper must be free to revolve in one direction.



## CONTROL MOTORS

### MICROTROLS FOR PROPORTIONING CONTROL



**Uses:** For proportioning control of dampers in heating, ventilating, and air conditioning systems.

**Construction:** A Barber-Colman reversible shaded pole induction motor drives the main shaft through a reduction of machine-cut gears. All steel gears are heat treated. Cam-operated switches stop motor at end of stroke. Internal potential dividing rheostat with contact arm driven directly from the power output shaft. Fixed speed. Bakelite terminal block with coded terminals. Mechanism protected by metal cover with black crinkle finish. Cover includes two  $\frac{1}{2}$ " conduit knockouts. Shaft diameter  $\frac{1}{2}$ ".

**Power Requirements:** 25 volt, 60 cycle, AC. Motor input 1.1 amperes.

**Control:** Barber-Colman Microtherm or Micro-Hygrostat. Rheostat in control motor energizes Microtherm solenoid, which exerts pull on contact tongue to position control motor in accordance with load demand. May also be positioned from manual rheostat and Polarized Microrelay, or from proportioning type controllers using potential sensitive relays. Control circuit current 0.30 amperes. Auxiliary cam-operated switches with rating of 2.5 amperes at 25 volts may be used to control additional valves, relays, signal lights, etc.

**Installation:** May be installed in any position. For longest life, maximum ambient temperature should not exceed 115°F.

**Dimensions:** Approximately  $5\frac{3}{8}$ " wide x 6" high x 6" long. (See page 29 for linkage.)

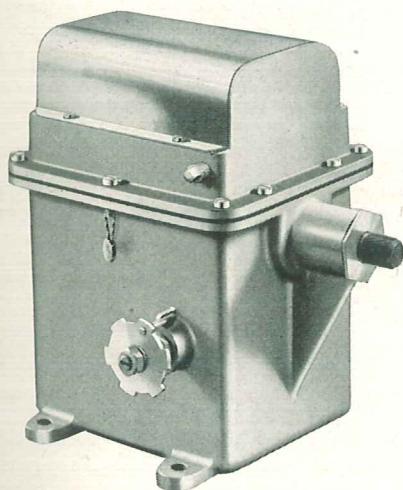
### SPECIFICATIONS

TYPE	TIMING SECS./360°	TORQUE LB. IN.	MAXIMUM DAMPER SIZE SQ. FT.	LIMITS OF TRAVEL
FYCC 617M	300	135	35	180°
FYCC 613M	300	135	35	90°

#### STANDARD CAM ARRANGEMENT

Two auxiliary cam operated switches, one closed only at end of CW Stroke and one closed only at end of CCW Stroke. Common of switches connected to ground by external jumper. Special cam arrangements available on order.

### OIL SUBMERGED MICROTROLS FOR PROPORTIONING CONTROL



**Uses:** For proportioning control of dampers in heating, ventilating, and air conditioning systems, dryers, etc.

**Construction:** A Barber-Colman reversible shaded pole induction motor drives the main shaft through a gear reduction of machine-cut, heat-treated gears. Cam-operated switches stop motor at end of stroke. Internal potential dividing rheostat with contact arm driven directly from the power output shaft. Entire operating mechanism is completely submerged in oil, and sealed in a die cast case, insuring long life with a minimum of service. Adjustable speed units have a maximum timing of approximately ten times normal. Bakelite terminal block with large coded terminals. Cover includes two  $\frac{1}{2}$ " conduit knockouts. Shaft diameter  $\frac{1}{2}$ ".

**Power Requirements:** 25 volt, 60 cycle, AC. Motor input 2.3 amperes.

**Control:** Barber-Colman Microtherm or Micro-Hygrostat. Rheostat in control motor energizes Microtherm solenoid, which exerts pull on contact tongue to position control motor in accordance with load demand. May also be positioned from manual rheostat and Polarized Microrelay, or from proportioning type controllers using potential sensitive relays. Control circuit current 0.46 amperes. Auxiliary cam-operated switches with rating of 2.5 amperes at 25 volts may be used to control additional motors, relays, signal lights, etc.

**Installation:** May be installed in any position, but upright mounting is preferable. For longest life, maximum ambient temperature should not exceed 150°F.

**Dimensions:** Approximately  $5\frac{3}{8}$ " wide x  $7\frac{1}{4}$ " high x 7" long. (See page 29 for linkage.)

### SPECIFICATIONS

TYPE	LIMITS OF TRAVEL	SPEED	TIMING SECS./360°	TORQUE LB. IN.	MAXIMUM DAMPER SIZE SQ. FT.
EYCC 523-1M	180°	Fixed	225	220	75
EYCC 537-1M	180°	Adj.	225 — 2250	220	75
EYCC 524-1M	90°	Fixed	225	220	75
EYCC 534-1M	90°	Adj.	225 — 2250	220	75

#### STANDARD CAM ARRANGEMENT

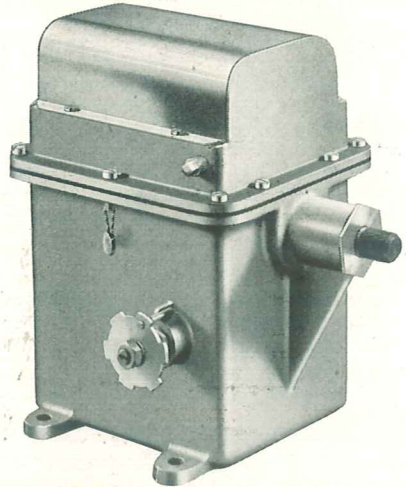
Two auxiliary cam operated switches, one closed only at end of CW Stroke and one closed only at end of CCW Stroke. Common of switches connected to ground by external jumper. Special cam arrangements available on order.

Operators are available without rheostats for floating control applications. Omit suffix "M" from part number; for example, EYCC 537-1. Similar control motors for line voltage service are also available.



## INDUSTRIAL CONTROL MOTORS (HIGH VOLTAGE TYPE)

### FOR TWO POSITION, FLOATING AND PROPORTIONING CONTROL



These heavy duty 115 or 230 V., 60 cycle AC., control motors are ideal for applications requiring a high torque motor and gear reduction with built-in limit switches. A few of the common uses are:

Regulation of dampers in heating, ventilating and drying systems.

Operation of butterfly valves, blast gates, etc.

Operation of air and gas valves, multiple ratio fuel valves, and industrial fuel carburetors.

They are also suitable for driving program switches, rheostats, speed changing screws on variable speed transmissions, the regulation of throttles on internal combustion engines, and many other applications.

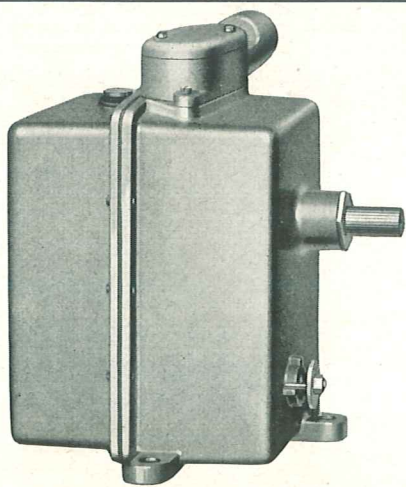
See page 29 for linkage.

CLASS	1	2	3	4	5
	2-Position	Reversible (For 2-Position or Floating Control)	Reversible 3, 4, or 5-Position	Proportioning (For use with Barber-Colman Microtherm)	Proportioning (For use with slide wire instruments)
TIMING Seconds Per 180° No. Load	22 60 100	30 75 115	30 75 115	30 75 115	30 75 115
TORQUE Lb. In.	80 175 300	50 100 220	50 100 220	50 100 220	50 100 220

When ordering specify class, type HYCC, timing, fixed or adjustable speed, limits of travel, voltage, and frequency.

Complete information available on application.

### FOR TWO POSITION, FLOATING AND PROPORTIONING CONTROL



These heavy duty, 115 or 230 V., 60 cycle AC., control motors are ideal for applications requiring a heavy duty, high torque motor and gear reduction with built-in limit switches. A few of the common uses are:

Regulation of heavy dampers in combustion control systems.

Operation of large butterfly valves, blast gates, etc.

Operation of large air and gas valves, multiple ratio fuel valves, and industrial fuel carburetors.

They are also suitable for operating dampers on dust collector installations, driving speed changing screws and hydraulic couplings, and many other applications.

See page 29 for linkage.

CLASS	1	2	3	4	5
	2-Position	Reversible (For 2-Position or Floating Control)	Reversible 3, 4, or 5-Position	Proportioning (For use with Barber-Colman Microtherm)	Proportioning (For use with slide wire instruments)
TIMING Seconds per 180° No. Load	30 60	30 60	30 60	50 100	50 100
TORQUE Lb. In.	350 750	350 750	350 750	260 560	260 560

When ordering specify class, type AYCK, timing, fixed or adjustable speed, limits of travel, voltage, and frequency.

Complete information available on application.



# PROGRAM SWITCHES

The Barber-Colman Program Switch consists of a series of snap acting switches operated in sequence by a reversing motor drive. It may be used to start compressor motors or pumps in sequence; to operate solenoid valves in succession; or to control Motor-Operated Valves in steam jet refrigeration units, sprinkler systems, pasteurizers, or industrial process work. Three standard types of Program Switches are offered. Momentary contact units and special timing devices are available on order.

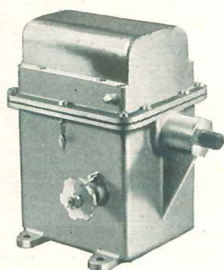
**Progressive Control Type:** For multiple step control of compressors, pumps, solenoid valves, relays, etc. Single-pole single-throw switches close circuits in sequence as motor-driven camshaft rotates, and open in reverse sequence when rotation is in opposite direction. Protection against excessive starting loads following a power failure is provided by an interlocking circuit that returns the Program Switch to the "off" position before any motors may be started.

Power failure feature requires one CYZP 35 Relay for each Program Switch.

**Selective Control Type:** For reversing the operating sequence of compressors in multiple step control to equalize the wear. Similar to Progressive Control Program Switch, except there is a centrally located "off" position, from which rotation in one direction gives one sequence of operation, and rotation in the other direction gives the opposite sequence. Operating sequence is reversed by a time switch (not part of Program Switch) that operates only when one or more compressors are running, so that the change of sequence is based on hours of actual operation.

Power failure feature to prevent excessive starting loads requires one CYZP 35 Relay for each Program Switch.

**2-Position Valve Control Type:** For control of 2-Position Motor-Operated Valves in sequence. Single-pole double-throw switches close one series of circuits in sequence as motor-driven camshaft rotates, and breaks this series, making another, when rotation is in opposite direction.



## SPECIFICATIONS—LOW VOLTAGE SWITCHES

**Construction:** Low voltage oil-submerged control motor with cam operated single-pole single-throw switches. Adjustable speed mechanism gives maximum timing of ten times normal; for example, 115 to 1150 seconds per stroke.

**Switch Rating:** 2.5 amps. at 25 V.

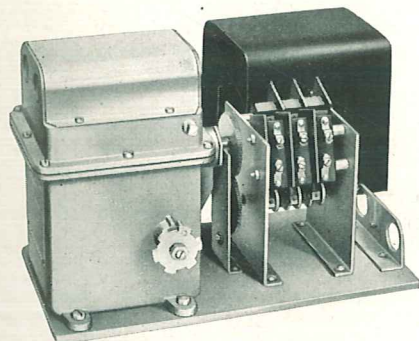
**Power Requirements:** 25 Volt, 60 Cycle.

**Control:** Barber-Colman Microtherm for proportioning or positioning control. Available without rheostat for use with non-detent type thermostat for floating control; omit suffix "M" from part number, for example EYZF 880-1.

**Installation:** May be installed in any position, but upright mounting is recommended.

**Dimensions:** 6" wide, 7 $\frac{7}{16}$ " high, 7" long.

ITEM NUMBER	TYPE	No. OF SWITCHES	TIMING SECS./STROKE
EYCF 880-1M	Progressive Control	2	115 — 1150



## SPECIFICATIONS—HIGH VOLTAGE SWITCHES

**Construction:** Consists of a low voltage oil-submerged driving unit and a driven unit containing cam shaft and high-voltage switches, all mounted on a single base plate. Adjustable cams may be rotated to change the operation of switches. Single-pole double-throw switches on 2-Position Valve Control type; single-pole single-throw normally open switches on Progressive and Selective Control types. Adjustable speed mechanism gives maximum timing of ten times normal, for example, 115 to 1150 seconds per stroke.

**Switch Rating:** 10 amps. at 125 V. AC.; 5 amps. at 250 V. AC.; 3 amps at 460 V. AC.

**Power Requirements:** 25 Volt, 60 Cycle.

**Control:** Barber-Colman Microtherm for proportioning or positioning control. Available without rheostat for use with non-detent type thermostat for floating control; omit suffix "M" from part number, for example GYZF 791.

**Installation:** May be installed in any position, but upright mounting is recommended.

**Dimensions:** 6" wide, 7 $\frac{7}{8}$ " high, 10 $\frac{3}{4}$ " long.

ITEM NUMBER	TYPE	No. OF SWITCHES	TIMING SECS./STROKE
GYZF 791M	Progressive Control.....	2	115 — 1150
GYZF 792M	Progressive Control.....	3	115 — 1150
GYZF 793M	Progressive Control.....	4	115 — 1150
GYZF 794M	Progressive Control.....	5	115 — 1150
GYZF 795M	Progressive Control.....	6	115 — 1150
GYZF 811M	Selective Control.....	2	115 — 1150
GYZF 812M	Selective Control.....	3	115 — 1150
GYZF 813M	Selective Control.....	4	115 — 1150
GYZF 814M	Selective Control.....	5	115 — 1150
GYZF 815M	Selective Control.....	6	115 — 1150
GYZF 801M	2-Position Valve Control.....	2	115 — 1150
GYZF 802M	2-Position Valve Control.....	3	115 — 1150
GYZF 803M	2-Position Valve Control.....	4	115 — 1150
GYZF 804M	2-Position Valve Control.....	5	115 — 1150
GYZF 805M	2-Position Valve Control.....	6	115 — 1150



## ELECTRICAL ACCESSORIES

### POWER BOXES

A Power Box consists of a transformer and overload circuit breaker mounted in a surface type steel cabinet. The circuit breaker for 440 and 550 volt transformers is mounted in a separate box, 6 $\frac{5}{8}$ " x 4 $\frac{3}{4}$ " x 3". Information on flush type 115 and 230 volt Power Boxes are available on request.

Standard 25 volt, 60 cycle Valve Operators or Control Motors may be used with Barber-Colman 50 cycle transformers.

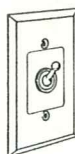
PART No.	CAPACITY VA	PRIMARY VOLTAGE	SECONDARY VOLTAGE	FREQUENCY CYCLES	BOX SIZE INCHES
BYZP 961*	50	115	25	60	6x8x4
BYZP 997	50	208	25	60	6x8x4
BYZP 962*	50	230	25	60	6x8x4
BYZP 963	50	440	25	60	6x8x4
BYZP 964	50	550	25	60	6x8x4
BYZP 965	50	115	23	50	6x8x4
BYZP 966	50	230	23	50	6x8x4
BYZP 967	50	440	23	50	6x8x4
BYZP 968	50	550	23	50	6x8x4
BYZP 969	50	115	25	25	6x8x4
BYZP 970	50	230	25	25	6x8x4
BYZP 971	50	440	25	25	6x8x4
BYZP 972	50	550	25	25	6x8x4
BYZP 973*	100	115	25	60	6x8x4
BYZP 998	100	208	25	60	6x8x4
BYZP 974*	100	230	25	60	6x8x4
BYZP 975	100	440	25	60	6x8x4
BYZP 976	100	550	25	60	6x8x4
BYZP 977	100	115	23	50	6x8x4
BYZP 978	100	230	23	50	6x8x4
BYZP 979	100	440	23	50	6x8x4
BYZP 980	100	550	23	50	6x8x4
BYZP 981	100	115	25	25	8x8x6
BYZP 982	100	230	25	25	8x8x6
BYZP 983	100	440	25	25	8x8x6
BYZP 984	100	550	25	25	8x8x6
BYZP 985*	150	115	25	60	8x8x6
BYZP 986*	150	230	25	60	8x8x6
BYZP 987	150	115	23	50	8x8x6
BYZP 988	150	230	23	50	8x8x6
BYZP 989	150	115	25	25	8x8x6
BYZP 990	150	230	25	25	8x8x6
BYZP 991*	250	115	25	60	8x8x6
BYZP 992*	250	230	25	60	8x8x6
BYZP 993	250	115	23	50	8x8x6
BYZP 994	250	230	23	50	8x8x6
BYZP 995	250	115	25	25	8x8x8
BYZP 996	250	230	25	25	8x8x8

\*Stock Item.



### SWITCH ASSEMBLIES

Assembly consists of switch and plate with identification and position marking ready for mounting on standard switch box.



PART No.	TYPE OF SWITCH	PLATE	RATING	
			AMPS.	VOLTS
SYZE 1	Single-pole, single-throw	Surface	1	250
SYZE 2	"	Flush	"	"
SYZE 3	Single-pole, double-throw	Surface	"	"
SYZE 4	"	Flush	"	"
SYZE 5	Double-pole, double-throw	Surface	"	"
SYZE 6	"	Flush	"	"
SYZE 85	"	"	5	"
SYZE 9	Four-pole, double-throw	Surface	"	25
SYZE 10*	"	Flush	"	"
SYZE 87*	"	"	"	250
SYZE 14*	Six-pole, double-throw	"	"	25
CYZE 923	3-Point	Surface	"	"
CYZE 924	"	Flush	"	"
CYZE 925	4-Point	Surface	"	"
CYZE 926	"	Flush	"	"
CYZE 921	5-Point	Surface	"	"
CYZE 922	"	Flush	"	"

\*Two-gang plate. SYZE 14 requires box 2 $\frac{3}{4}$ " deep.

### TRANSFORMERS

Standard 25 volt, 60 cycle Valve Operators or Control Motors may be used with Barber-Colman 50 cycle transformers.

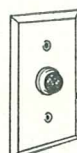
PART No.	CAPACITY VA	PRIMARY VOLTAGE	SEC. VOLTAGE	FREQ. CYCLES
BYZP 83*	35	115	25	60
BYZP 15*	50	115	25	60
BYZP 60*	50	208	25	60
BYZP 16*	50	230	25	60
BYZP 19-1*	50	440	25	60
BYZP 20-1*	50	550	25	60
BYZP 41*	50	115	23	50
BYZP 42*	50	230	23	50
BYZP 49	50	440	23	50
BYZP 50	50	550	23	50
BYZP 17*	50	115	25	25
BYZP 18*	50	230	25	25
BYZP 35*	50	440	25	25
BYZP 36*	50	550	25	25
BYZP 21*	100	115	25	60
BYZP 61*	100	208	25	60
BYZP 22*	100	230	25	60
BYZP 37*	100	440	25	60
BYZP 38*	100	550	25	60
BYZP 43*	100	115	23	50
BYZP 44*	100	230	23	50
BYZP 51	100	440	23	50
BYZP 52	100	550	23	50
BYZP 23*	100	115	25	25
BYZP 24*	100	230	25	25
BYZP 39*	100	440	25	25
BYZP 40*	100	550	25	25

\*Stock Item.

### ARMORED CABLE

This armored thermostat cable consists of a number of conductors encased in a tinned and braided copper armor. Each conductor is covered with heat resistant rubber insulation and lacquered cotton braid. Approximate diameter, 1/4" for DYZP 20 and 21, 1/2" for DYZP 22.

PART No.	No. OF CONDUCTORS	WIRE SIZE
DYYP 20	2	No. 14
DYYP 21	4	3 No. 18, 1 No. 16
DYYP 22	6	5 No. 18, 1 No. 16



Assembly

### SIGNAL LIGHTS

Assembly includes signal light, lamp, and switch plate, ready for mounting on a standard switch box. Specify if surface or flush type plate desired. Signal light has 3/4" round lens.



Signal Light

PART No.	DESCRIPTION
EYYP 9-1	Red Signal Light Assembly
EYYP 10-1	Green Signal Light Assembly
EYYP 40-1	Red Signal Light
EYYP 41-1	Green Signal Light

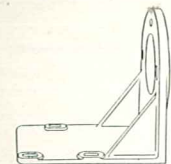
### WIRE

PART No.	No. OF CONDUCTORS	WIRE SIZE	COVERING
DYYP 1	1	16	Asbestos
DYYP 2	2	16	"
DYYP 3	2	18	Asbestos
DYYP 4	3	18	"
DYYP 13	4	18	"
DYYP 5	1	16	Rubber
DYYP 14	3	16	Heat Resistant Rubber
DYYP 15	2	18	Heat Resistant Rubber
DYYP 12	3	18	" " "
DYYP 17	4	18	" " "
DYYP 16	5	18	" " "

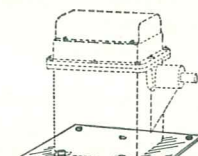


## ACCESSORIES

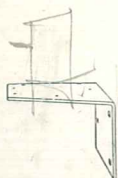
### MOUNTING FOR CONTROL MOTORS



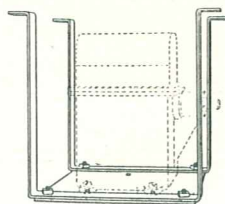
Direct  
Mounting Bracket



Base Plate



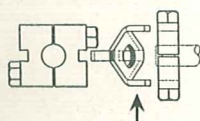
Angle Bracket



Ceiling Bracket

PART No.	DESCRIPTION
EYCC 246-1	Angle Bracket. For EYCC and FYCC Motors
EYCC 79-3	Direct Mounting Bracket. For EYCC and FYCC Motors
EYCC 124-1	Base Plate. " " " " "
EYCC 298-1	Ceiling Bracket. " " " " "
AYCG 203-2	Angle Bracket. For AYCG and CYCH Motors
AYCG 79-2	Direct Mounting Bracket. For AYCG and CYCH Motors
AYCG 124-1	Base Plate. " " " " "
AYCG 234-1	Ceiling Bracket. " " " " "
AYCK 113	Angle Bracket. For AYCK Motors
AYCK 114	Base Plate. " " " " "

### DIRECT CONNECT COUPLING



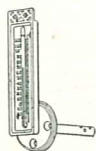
For coupling control motor direct to shaft of damper.  $\frac{1}{2}$ " size.

EYCC 199-1 EYCC 125-1

PART No.	DESCRIPTION
EYCC 125-1	Coupling
EYCC 199-1	Coupling Disc — 2 Required

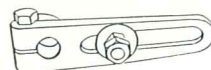
### THERMOMETER

Angle type for mounting on duct.  
Red spirit filled. 6" cast iron case.  
5" brass stem.



PART No.	RANGE, DEGREES FAHRENHEIT
FYDJ 275-1	-20 to 120

### CRANK ARM



For clamping on shaft of control motor. Link bolt adjustable in slot.

EYCC Crank has  $\frac{1}{2}$ " bore for clamping on  $\frac{1}{2}$ " shaft.

PART No.	CENTER DISTANCE	
	MINIMUM	MAXIMUM
EYCC 158-1	$\frac{7}{8}$ "	$1\frac{1}{2}$ "
EYCC 137-1	$\frac{7}{8}$ "	$2\frac{1}{2}$ "
EYCC 81-1	1"	$3\frac{1}{4}$ "
EYCC 78-1	1"	5"

AYCK Crank has  $\frac{3}{4}$ " bore for clamping on  $\frac{3}{4}$ " shaft.

PART No.	CENTER DISTANCE	
	MINIMUM	MAXIMUM
AYCK 89	3"	5"
AYCK 90	4"	7"
AYCK 91	6"	10"

### DAMPER LINK



Length adjustable. Consists of two pieces clamped together by screws.

End holes of EYCC link drilled  $\frac{25}{64}$ " to fit stud of EYCC crank.

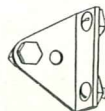
PART No.	CENTER DISTANCE	
	MINIMUM	MAXIMUM
EYCC 117 A	$5\frac{1}{4}$ "	$6\frac{3}{4}$ "
EYCC 117 B	$6\frac{3}{4}$ "	$9\frac{3}{4}$ "
EYCC 117 C	$9\frac{3}{4}$ "	$14\frac{1}{4}$ "
EYCC 117 D	$14\frac{1}{4}$ "	$20\frac{1}{4}$ "
EYCC 117 E	$20\frac{1}{4}$ "	$26\frac{1}{4}$ "
EYCC 117 F	$26\frac{1}{4}$ "	$32\frac{1}{4}$ "

End holes of AYCK link drilled  $\frac{3}{64}$ " to fit stud of AYCK crank.

PART No.	CENTER DISTANCE	
	MINIMUM	MAXIMUM
AYCK 92-1	$13\frac{1}{2}$ "	21"
AYCK 93	$20\frac{1}{4}$ "	$26\frac{1}{4}$ "

### DAMPER CLIP

Angle Clip for connecting link to damper louver.



PART No.
EYCC 198

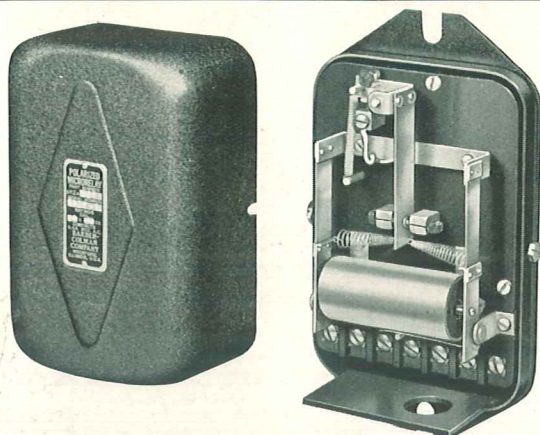
Straight Clip for connecting link to damper tie bar.



PART No.
EYCC 95

## RELAYS

### POLARIZED MICRORELAY



For use in self-balancing bridge circuits; remote positioning and control of motor-operated valves and control motors; control of temperature, pressure, pH, moisture regain and synchronization of control motors, and motor-operated valves operated in parallel.

**Construction:** Consists of contact tongue, contacts, operating coils, polarizing coils, terminals, and adjusting means, all mounted on base with cover. Moving parts suspended on springs. This pivotless construction permits the use of heavy-duty parts without loss of sensitivity.

**Contacts:** Fine silver. Single-pole, double-throw, with floating position.

**Case:** Sheet steel base with molded sub-base. Cover of drawn-steel, with black crinkle finish.

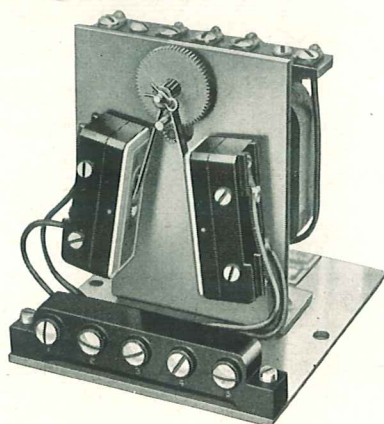
**Installation:** May be mounted in any position provided the armature is in a horizontal plane.

**Dimensions:**  $\frac{5}{16}$ " wide,  $7\frac{5}{8}$ " high,  $2\frac{5}{8}$ " deep.

TYPE	SENSITIVITY	RATING
DYZA 903	0.5V	0.5 amps. at 25V; AC.
DYZA 904-4	0.2V	1.5 amps. at 25V; AC.

### MOTOR RELAY

**Uses:** For use with Polarized Microrelay, or any floating contact device, in applications where the control current exceeds the contact rating of the control device or where a time delay is required.



**Construction:**

Consists of a reversible geared head Barcol motor, totally enclosed switches, switching mechanism, and terminal, all mounted on a cadmium plated steel base. Unit is unenclosed.

**Operation:** When one pair of shading coils is energized from control circuit, the motor runs to a mechanically stalled position closing the corresponding switch; when shading coil circuit is opened, motor returns to mid-position and opens the switch. Chattering is eliminated because a momentary contact at the controlling instrument will not cause the Motorelay to run long enough to close a switch circuit.

**Rating:** Non-inductive load — 10 amperes at 110 or 220 volts.

**Installations:** Must be mounted in upright position.

**Dimensions:**  $4\frac{1}{8}$ " high,  $4\frac{1}{4}$ " long,  $3\frac{3}{4}$ " wide.

TYPE	MOTOR
CYZA 912-1	115 V. 60 cy., AC.
CYZA 913-1	25 V. 60 cy., AC.

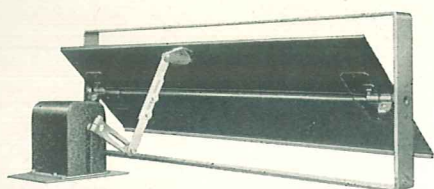
### MISCELLANEOUS TYPE RELAYS

Contact Arrangement	Type	Coil Voltage	Max. Load Amps. Non-Indc. 220 V or Less	H.P. Single Phase	
				115 V	230 V
Single Pole Single Throw	CYZP 1	25	15	$\frac{1}{2}$	$\frac{1}{2}$
	CYZP 27	115	15	$\frac{1}{2}$	$\frac{1}{2}$
	CYZP 27	230	15	$\frac{1}{2}$	$\frac{1}{2}$

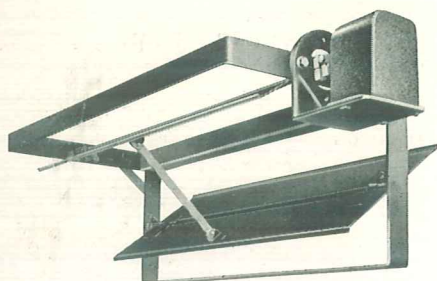
Contact Arrangement	Type	Coil Voltage	Max. Load Amps. Non-Indc. 220 V or Less	H.P. Single Phase	
				115 V	230 V
Single Pole Double Throw	CYZP 3-1	25	10	$\frac{1}{2}$	$\frac{1}{2}$
	CYZP 4-1	115	10	$\frac{1}{2}$	$\frac{1}{2}$
	CYZP 5-1	230	10	$\frac{1}{2}$	$\frac{1}{2}$



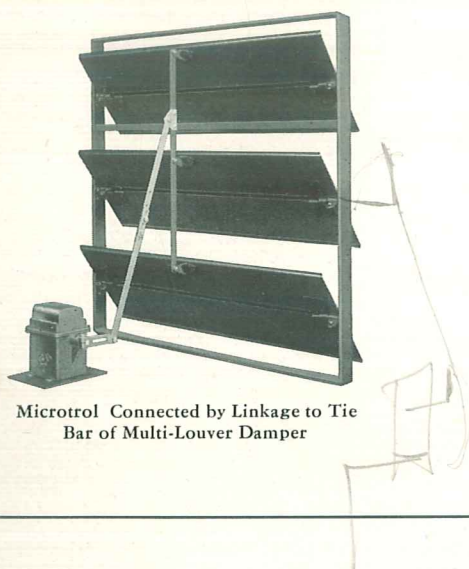
## DAMPERS



Microtrol Connected by Linkage  
to Single Louver Damper



Microtrol Direct Connected to  
Double Mixing Damper



Microtrol Connected by Linkage to Tie  
Bar of Multi-Louver Damper

Control dampers play an important role in heating, ventilating, and air conditioning systems. In order to provide proper control, dampers must be constructed to meet the requirements of a particular installation. Barber-Colman control dampers have been especially designed for temperature control work and are available in a variety of types.

All dampers over 48" in width or 10 square feet in area are built in two or more sections with interconnections. All dampers over 18" in any direction will have corner braces on the frame. Maximum available height is 8' in one section. Dampers over 8' in height will be built in two or more sections with interconnecting blade tie rods. Blades are constructed of No. 16 gauge steel.

### SPECIAL FEATURES AVAILABLE:

1. Copper dampers to be built to specifications of 20, 24, or 30 ounce copper. Frames to be copper sprayed iron channel, or brass bar stock.
2. Gray enamel, copper spray, or aluminum finish.
3. Felted edges.
4. Opposed action blades.
5. Round louver type dampers available on special order.

### WHEN ORDERING SPECIFY:

1. Damper type required.
2. Actual damper size.
3. Location of extended shaft if used.
4. Method of mounting control motor.
5. Damper function.
6. Special features required.

## CONTROL SYSTEMS

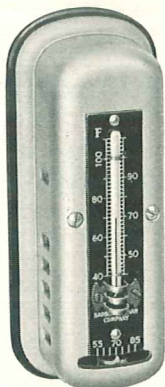
### *Econostat* OUTDOOR — INDOOR CONTROL SYSTEM



The Barber-Colman Econostat regulates the heating system of a building directly from outdoor temperatures by supplying heat at intervals. It maintains a comfortable indoor temperature by varying the "heat on" periods in accordance with outdoor temperature changes. The heat supplied to the building is in proportion to the heat loss from the building and is, therefore, not dependent upon the temperature in any particular room. The Econostat provides better temperature control with reduced fuel costs. It supplies heat only when needed, and it controls throughout the entire heating season.

Complete information available on application.

### COMPENSATED CONTROL SYSTEMS



Room Thermostat

The outstanding feature of Barber-Colman COMPENSATED CONTROL is a means for overcoming a common cause of overheating called "overrun". Overrun is caused by the heat stored in the system at the time the thermostat shuts off the source of heat; that is, the oil burner, stoker, or gas valve. Hence the effect of overrun is at its worst in mild weather; an oversized heating system produces a similar effect. Compensated Control eliminates overrun by using the stored heat in the system to bring the room temperature up to the desired point.

The COMPENSATED CONTROL system differs from other heater thermostat installations in that *heat anticipation is provided only when needed, and in just the right amount*. This is accomplished by another thermostat (VARITHERM) mounted on one of the zone radiators, or in one of the air supply ducts, which causes the room thermostat heater to be energized only after a rise in radiator or duct temperature. This automatically provides the right amount of heat anticipation at all times, and varies the length of each cycle in accordance with the heat requirements, thus maintaining higher radiator temperatures in cold weather, and lower radiator temperatures in mild weather.



Varitherm

With COMPENSATED CONTROL, distribution difficulties which are often encountered in throttling the heat supply are eliminated, because the cycling operation results in heat being available at full force when needed. Expansion noises are reduced to a minimum, and cold drafts are eliminated because the radiation does not become cold between heating intervals.

COMPENSATED CONTROL is equally suitable for new and existing buildings, as it is not dependent upon a tight heating system. It is adaptable to one or two-pipe systems, vacuum systems, high or low pressure systems, warm air systems, any one of which may be fired with an oil burner, a stoker, or supplied by central station steam.

Complete information on application.



# ENGINEERING INFORMATION

## VEE-PORTED VALVE CAPACITIES FOR SATURATED STEAM

Throttling and Proportioning Service

Capacity in Pounds of Steam per Hour

Valve Size Inches	2# Initial Gage Pressure			5# Initial Gage Pressure				10# Initial Gage Pressure				
	Pressure Drop			Pressure Drop				Pressure Drop				
	1/4#	1/2#	1#	1/2#	1#	2#	3#	1#	2#	3#	5#	7#
1/2	14	20	30	20	28	40	50	32	45	55	70	85
3/4	30	45	60	45	65	90	115	75	105	130	170	200
1	60	80	115	85	120	170	210	130	185	225	290	350
1 1/4	90	125	175	130	185	260	320	205	285	355	460	540
1 1/2	125	175	250	190	270	380	475	290	410	500	650	770
2	210	300	425	320	450	630	780	495	700	850	1100	1300
2 1/2	350	500	700	550	740	1100	1300	800	1100	1400	1800	2100
3	550	775	1090	850	1200	1670	2000	1300	1800	2300	2900	3400
3 1/2	725	1000	1450	1100	1550	2200	2700	1700	2400	2900	3800	4500
4	950	1350	1900	1400	2000	2800	3500	2300	3300	4000	5100	6100
5	1500	2100	3000	2200	3100	4400	5400	3500	5000	6100	7800	9300
6	2100	2900	4100	3100	4400	6200	7600	4800	6800	8300	10,700	12,700

NOTE: Recommended Pressure Drop for Throttling and Proportioning Service is approximately 50% of Initial Gage Pressure.

## FLOW OF WATER THROUGH VEE-PORTED VALVES

Gallons per Minute

Pressure Drop Across Valve (Lbs./Sq. In.)	VALVE SIZE										
	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"
1	2.5	5	9	14.5	21	37	56	85	117	150	225
2	3.5	7.5	12.5	20	28	52	80	118	160	205	320
3	4	9	16	25	35	65	98	148	200	245	400
4	4.5	10.5	18	28	40	74	112	168	225	285	450
5	5.5	12	21	32	46	82	125	185	250	330	500
10	7.5	16.5	29	45	63	118	175	260	350	450	700
15	9	20	35	55	80	145	220	325	440	560	870
20	10.5	23.5	42	65	90	165	245	370	500	660	1000
25	12	27	48	72	103	180	275	415	570	730	1165
30	13.5	30	52	78	116	200	300	455	630	790	1225
40	15	34	58	90	132	230	350	525	720	920	1425
50	16	37	65	100	145	260	400	590	790	1050	1600
60	18	40	72	113	160	285	435	650	875	1150	1750
70	20	43	78	122	175	310	470	710	965	1240	1900
80	21	47	84	132	187	330	500	745	1035	1320	2050
90	22	50	90	140	200	350	535	780	1100	1400	2160
100	23	52	92	150	210	375	570	820	1160	1480	2260

NOTE: Recommended Pressure Drop for Throttling and Proportioning Service is approximately 15% of Initial Gage Pressure.

## FLOW OF WATER THROUGH SINGLE SEAT AND 3-WAY VALVES

Gallons per Minute

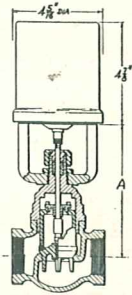
Pressure Drop Across Valve (Lbs./Sq. In.)	VALVE SIZE											
	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"
1	2.5	4	8	12	21	27	42	61	98	132	170	255
2	3.5	5.5	11.0	17	30	38	60	95	136	185	235	365
3	4.0	6.7	14.0	20	36	47	76	108	164	220	285	435
4	4.7	8.7	15.5	24	42	50	88	125	187	255	330	500
5	5.25	9.5	18.5	26	45	60	95	140	210	290	370	560
10	9.0	12.0	24	36	63	82	135	190	300	405	520	800
15	9.5	15.0	31	46.5	81	110	168	250	360	495	630	990
20	11.0	18.0	37	55	98	120	200	290	420	575	730	1150
25	12.0	20.0	40	60	105	135	220	310	465	635	820	1290
30	13.5	22	45	67	115	155	240	350	510	700	900	1420
40	15.5	25	50	78	130	175	280	400	580	800	1040	1590
50	17	28	57	90	150	200	310	450	650	900	1170	1750
60	19	32	64	100	160	220	350	500	710	1000	1280	1920
70	20	33	67	103	175	230	370	525	770	1100	1390	2090
80	22	36	70	110	190	250	400	575	820	1200	1495	2250
90	23	38	75	120	200	260	425	600	870	1300	1600	2450
100	24	40	80	125	210	275	450	635	915	1400	1700	2650
125	28	47	95	145	240	330	500	725	1050	1570	1920	3000

NOTE: Recommended Pressure Drop for Throttling and Proportioning Service is approximately 15% of Initial Gage Pressure. These capacities apply to single seat globe pattern valves; for single seat angle pattern, multiply the above capacities by 1.3.



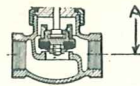
# ROUGHING IN DIMENSIONS

## YBA OPERATOR



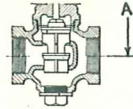
SINGLE SEATED  
PILOT PISTON

Size	A
1/2	5 3/4
3/4	5 3/4
1	6 1/4
1 1/4	6 3/4
1 1/2	6 3/4



SINGLE SEATED  
BRASS BODY

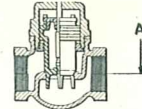
Size	A	
	Globe	Angle
1/4	4 1/4	....
3/8	4 3/8	....
1/2	4 1/2	4 1/2
3/4	4 13/16	4 3/4
1	5 1/8	4 15/16
1 1/4	5 3/8	5 1/8
1 1/2	5 3/4	5 1/2
2	6 1/4	6



DOUBLE SEATED  
SEMI BALANCED

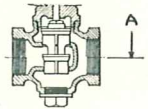
Size	A
1/2	4 1/4
3/4	4 3/8
1	5 1/8
1 1/4	5 3/8
1 1/2	5 3/4
2	8 3/8
2 1/2	11

## FYBA OPERATOR



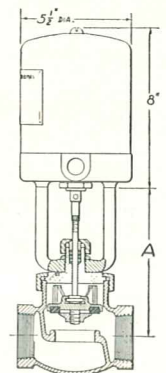
SINGLE SEATED  
PILOT PISTON

Size	A
1 1/4	7 3/4
1 1/2	8
2	8 3/8
2 1/2	13 3/8
3	14 1/2
3 1/2	15 1/2
4	15 1/4

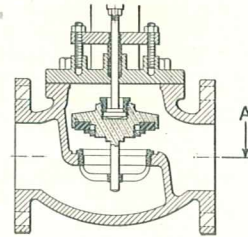


DOUBLE SEATED  
SEMI BALANCED

Size	A
2 1/2	9 3/4
3	12 3/4
3 1/2	13 3/4
4	13 3/8



SINGLE SEATED  
BRASS BODY

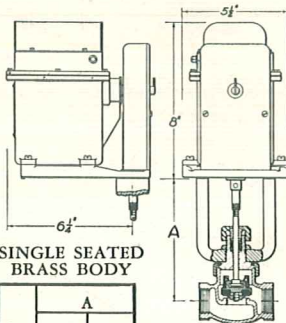
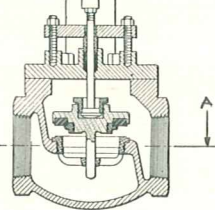


SINGLE SEATED  
CAST IRON BODY

## CYBG OPERATOR

### SINGLE SEATED CAST IRON BODY

Size	A	
	Globe	Angle
2	9 1/8	9 1/8
2 1/2	9 11/16	8 11/16
3	10 5/8	9 5/8
3 1/2	10 11/16	9 3/4
4	11 1/8	9 11/16



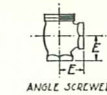
SINGLE SEATED  
BRASS BODY

Size	A	
	Globe	Angle
1	6 3/8	6 3/8
1 1/4	6 3/4	6 1/2
1 1/2	7	6 3/4
2	7 1/2	7 1/4

## DIMENSIONS OF VALVE BODIES

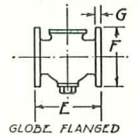
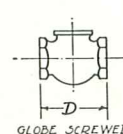
### SINGLE SEATED BRASS BODY VALVES

Size	D	E	F
1/4	2	....	....
3/8	2 1/8	....	....
1/2	2 11/16	1 3/4	2 1/8
3/4	3 1/8	1 1/2	3
1	3 3/4	1 11/16	3 1/2
1 1/4	4 1/4	2	4
1 1/2	4 3/4	2 1/8	4 3/8
2	5 3/4	2 11/16	....



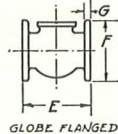
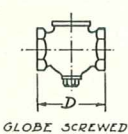
Z = No. OF BOLTS IN FLANGES

### SINGLE SEATED PILOT PISTON VALVES



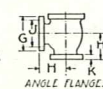
Y = SIZE OF BOLTS IN FLANGES

### DOUBLE SEATED SEMI BALANCED VALVES



SIZE	D	E	F	G	Y	Z
1/2"	2 1/4"					
3/4"	2 3/4"					
1"	3 3/8"					
1 1/4"	4"					
1 1/2"	4 1/2"					
2"	5 3/8"					
2 1/2"	6 3/8"					
3"	8 3/4"	8 3/4"	7 1/2"	3 1/4"	5/8"	4
3 1/2"	9 5/8"	9 5/8"	8 1/2"	13/16"	5/8"	8
4"	10 1/8"	10 1/8"	9"	15/16"	5/8"	8

### SINGLE SEATED CAST IRON VALVES



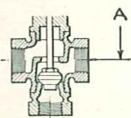
SIZE	D	E	F	G	H	J	K	Y	Z
2"	6 1/2"	3 1/4"	8"	6"	4"	4 3/4"	5/8"	5/8"	4
2 1/2"	8"	4"	9 1/2"	7"	4 3/4"	5 1/2"	11/16"	5/8"	4
3"	8 1/4"	4 1/8"	10"	7 1/2"	5"	6"	3/4"	5/8"	4
3 1/2"	9 1/2"	4 3/4"	11"	8 1/2"	5 1/2"	7"	13/16"	5/8"	8
4"	10 1/2"	5 1/4"	12"	9"	6"	7 1/2"	15/16"	5/8"	8

SIZE	D	E	F	G	Y	Z
1/2"	3"					
3/4"	3"					
1"	3 5/8"					
1 1/4"	4 1/4"					
1 1/2"	4 5/8"					
2"	5 5/8"					
2 1/2"	8 1/4"					
3"	8 3/4"	10"	7 1/2"	3 1/4"	5/8"	4
3 1/2"	9 5/8"	11"	8 1/2"	13/16"	5/8"	8
4"	10 1/8"	12"	9"	15/16"	5/8"	8



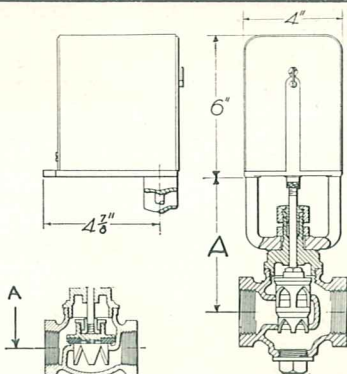
# ROUGHING IN DIMENSIONS

**BYBG  
OPERATOR**



**DOUBLE SEATED  
3-WAY VALVE**

Size	A
1/2	7
3/4	7 1/4
1	7 1/2
1 1/4	7 3/4
1 1/2	8
2	8 1/4



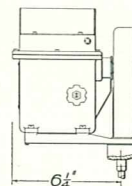
**SINGLE SEATED  
V. PORT VALVE**

Size	A
1/2	4 11/16
3/4	5 1/4
1	5 1/2
1 1/4	5 11/16
1 1/2	6 1/8
2	6 3/4

**DOUBLE SEATED  
V. PORT VALVE**

Size	A
1/2	4 11/16
3/4	4 11/16
1	5 3/8
1 1/4	5 1/2
1 1/2	5 1/2
2	8 3/8
2 1/2	9

**CYBG  
OPERATOR**



**DOUBLE SEATED  
3-WAY VALVE**

Size	A
1 1/2	10
2	10 1/4
2 1/2	10 1/2

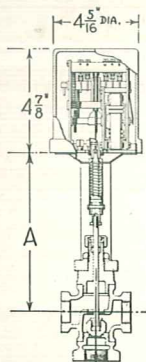
**SINGLE SEATED  
V. PORT VALVE**

Size	A
1/2	6 1/8
3/4	6 1/8
1	6 11/16
1 1/4	6 3/8
1 1/2	7 1/8
2	7 11/16

**DOUBLE SEATED  
V. PORT VALVE**

Size	A
1/2	6
3/4	6
1	6 1/16
1 1/4	6 3/4
1 1/2	6 3/4
2	7 3/8
2 1/2	9
3	10 11/16

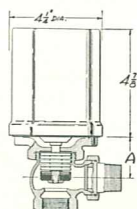
**YBA  
OPERATOR**



**DOUBLE SEATED  
3-WAY VALVE**

Size	A
1/2	6 3/8
3/4	7 1/8
1	7 1/2
1 1/4	7 3/4
1 1/2	8
2	8 1/4

**HYBA  
OPERATOR**

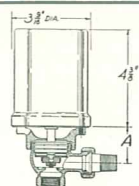


**PACKLESS  
RADIATOR  
VALVE**

SIZE	A
1"	1 3/4
1 1/4"	1 11/16
1 1/2"	2 3/8
2"	2 11/16

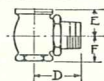
**GYBA  
OPERATOR  
PACKLESS  
RADIATOR  
VALVE**

SIZE	A
1/2"	1 3/8
3/4"	1 3/8

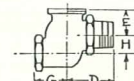


## DIMENSIONS OF VALVE BODIES

**PACKLESS RADIATOR VALVE**



**Angle**



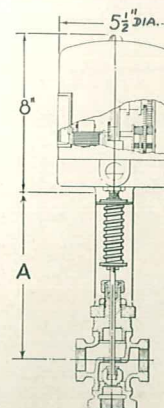
**Straightway**

SIZE	D	E	F	G	H
1/2"	3	15/16	1 1/8	1 3/8	5/8
3/4"	2 1/4	1	1 1/8	1 3/8	3/4
1"	3	1 1/8	1 1/8	1 3/8	1
1 1/4"	3 1/4	1 1/8	1 3/8	2 1/8	1 1/8
1 1/2"	3 3/4	1 11/16	1 3/8	2 1/8	1 1/4
2"	4 1/4	2 1/8	2 1/4	2 11/16	1 1/2

**FYBA  
OPERATOR**

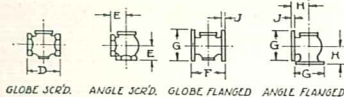
**DOUBLE SEATED  
3-WAY VALVE**

Size	A
1	9 1/2
1 1/4	9 3/4
1 1/2	10
2	10 1/4
2 1/2	10 1/2

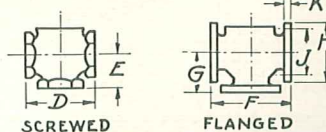


Y = SIZE OF BOLTS IN FLANGES  
Z = No. OF BOLTS IN FLANGES

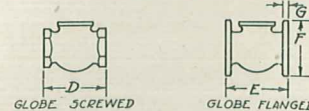
**DOUBLE SEATED V. PORT VALVE**



**DOUBLE SEATED 3-WAY VALVE**



**SINGLE SEATED V. PORT VALVE**



SIZE	D	E	F	G	H	J	Y	Z	SIZE	D	E	F	G	H	J	K	Y	Z	SIZE	D	E	F	G	Y	Z
1/2	2 1/2	1 1/8							1/2	2 3/8	1 1/16								1/2	2 13/16					
3/4	2 3/4	1 3/8							3/4	2 11/16	1 5/16								3/4	3 3/8					
1	3 3/8	1 3/4							1	3 1/4	2 5/16								1	3 1/8					
1 1/4	4	2							1 1/4	3 1/16	2 13/16								1 1/4	4 3/16					
1 1/2	4 1/2	2 1/4							1 1/2	4 3/16	2 7/8								1 1/2	4 11/16					
2	5 1/2	2 3/4	6	6	3 3/4	1/2	5/8	4	2	4 7/8	3 5/16								2	5 1/8					
2 1/2	6 3/8	3 1/4	6 3/4	7	4 1/4	9/16	5/8	4	2 1/2	4 1/2	3 1/8	8	4 1/2	7	5 1/2	1 1/16	5/8	4	2 1/2	8	9 1/2	7	1 1/16	5/8	4
3	8 3/4	4 3/8	8 3/4	7 1/2	4 3/4	3/4	5/8	4	3	4 3/4	4 5/16	9 1/2	4 3/4	7 1/2	6	3/4	5/8	4	~						
~									3 1/2	5 1/2	4 13/16	11	5 1/2	8 1/2	7	13/16	5/8	8	~						
~									4	6	6	12	6	9	7 1/2	15/16	5/8	8	~						



# TRANSFORMER CAPACITY TABLE

GROUP "B" APPARATUS TOTAL CONNECTED LOAD FACTOR REV. MOTORS IF NO. REQ'D IS NOT LISTED USE NEXT LARGER NO.		GROUP "A" APPARATUS																			
		TOTAL CONNECTED LOAD FACTOR-POSITIVE MOTORS IF NUMBER REQ'D IS NOT LISTED USE NEXT LARGER NUMBER.																			
		0	60	120	200	250	360	480	560	650	700	760	850	950	1000	1125	1250	1300	1425	1525	1725
0	X																				
45																					
70																					
90																					
115																					
140																					
160																					
180																					
210																					
230																					
250																					
280																					
300																					
315																					
345																					
360																					

GROUP "A" APPARATUS 2-POSITION (POSITIVE) MOTORS FACTOR FOR ONE OPERATOR	GROUP "B" APPARATUS REVERSIBLE MOTORS FACTOR FOR ONE OPERATOR	MICRO OPERATORS
CYBA or GYBA Operator..... 50	CYBG Valve Operator..... 57	64
YBA or HYBA Operator..... 50	BYBG Valve Operator..... (Micro only)	37
FYBA Valve Operator..... 75	CYBF Valve Operator..... 45	52
CYBG Valve Operator..... 75	CYBC Valve Operator..... 57	64
CYBC Valve Operator..... 75	EYCC Control Motor..... 57	64
AYCG Control Motor..... 40	AYCG Control Motor..... 25	32
EYCC Control Motor..... 75	AYCK Control Motor..... 120	..
AYCK 2-Position Control Motor should be figured as Group "B" Apparatus.	FYCC Control Motor..... (Micro only)	37
	Solenoid Valves..... 25	..
	Relays (25 V Coil)..... 8	..

**Example:—** Find size of transformer required for the following equipment.

## Group "A"

1 FYBA Valve Oper.....	75
2 YBA Valve Oper. 2 x 50.....	100
	175

Also:—

## Group "B"

2 EYCC Rev. Motor 2 x 57.....	114
2 BYBG Mic. Oper. 2 x 37.....	74
	188

**Refer to Chart —**

Intersection of Horizontal Line from 210 (Group "B" Apparatus) and vertical line from 200 (Group "A" Apparatus) indicates 150VA Transformer is required.

**Note —**

If group "A" total factor exceeds 3000 or if group "B" total factor exceeds 360, more than one transformer is required. Divide into small enough groups to fit table.



